

**An Urban Intervention: Enabling Frameworks**

by  
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Submitted to the Department of Architecture on  
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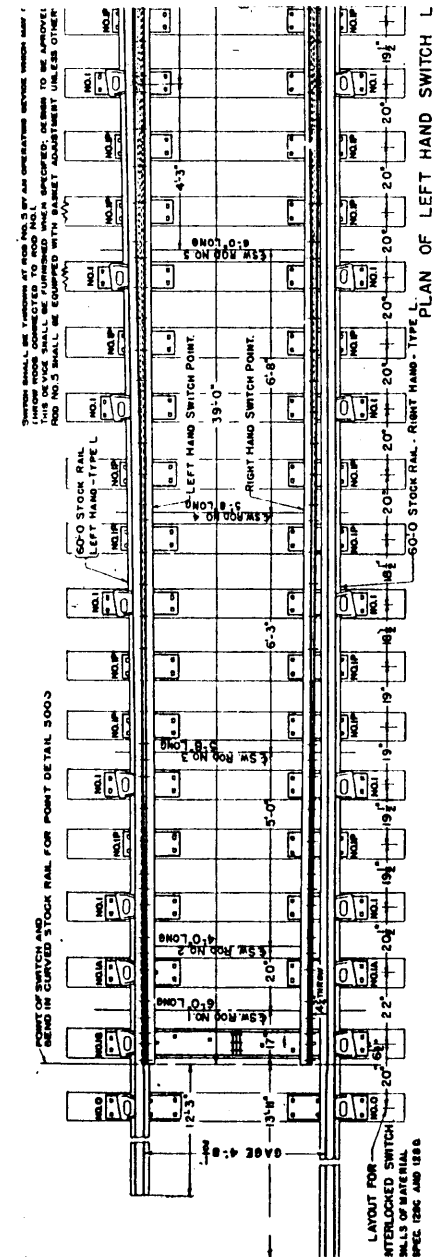
**ABSTRACT**

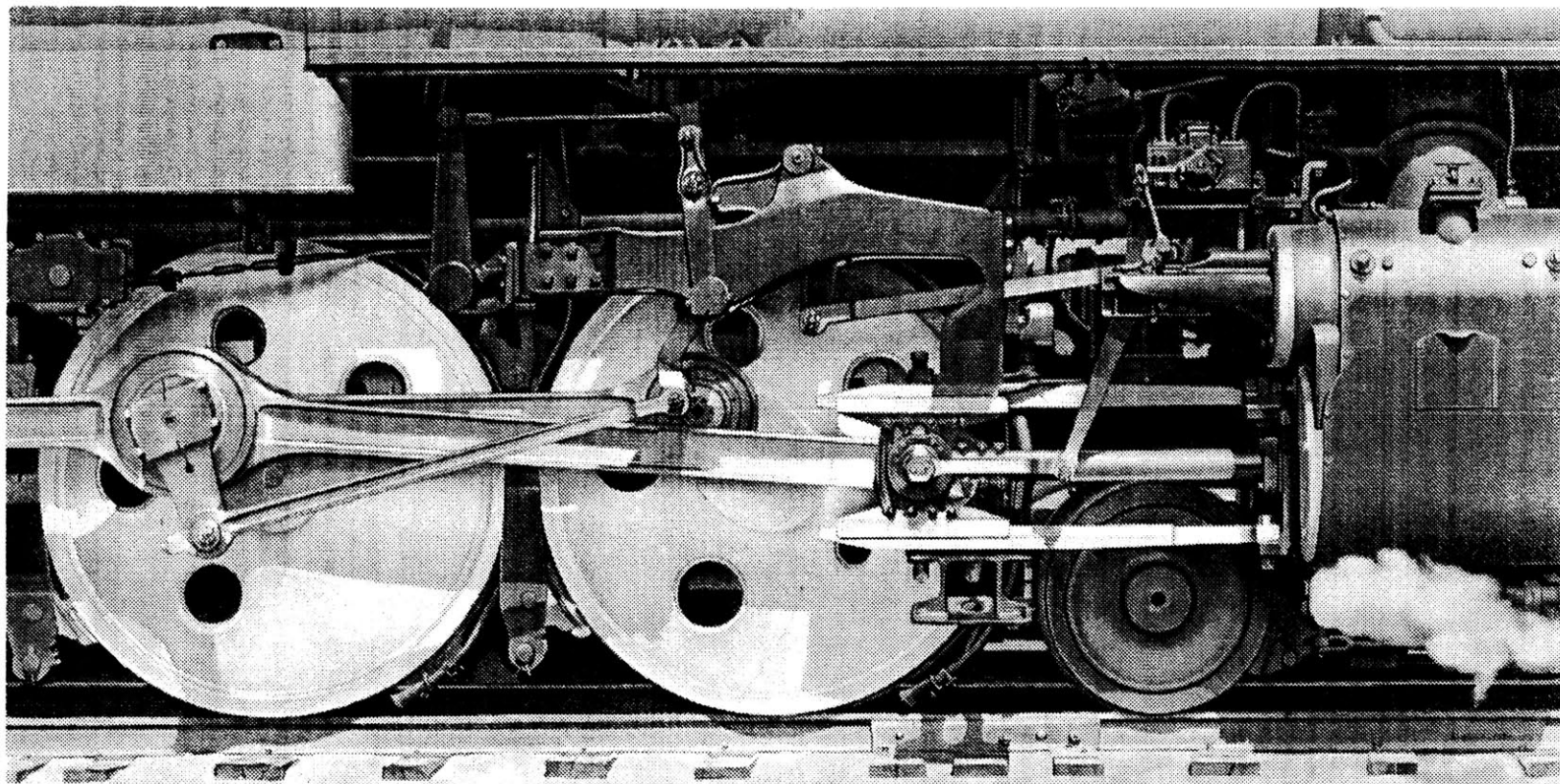
The relationship between design and the idea of a framework is essentially an attitude about ordering. A framework is an intellectual proposition which can support a variety ideas, and in doing so, it provides a resolution to these intersections. The framework may be thought of as a mechanism, a joint, for bringing together these things, that enables other levels of intervention to occur.

Thesis Supervisor:

Jan Wampler

Title: Professor of Architecture







## 1.0 INTRODUCTION

### 1.1 Higher levels of intervention: urban mirrors

It is rare that an intervention is made that makes us look at the city in a completely refreshing way. To see what has always been in the city, though intangible, is like looking at oneself in a mirror for the first time.

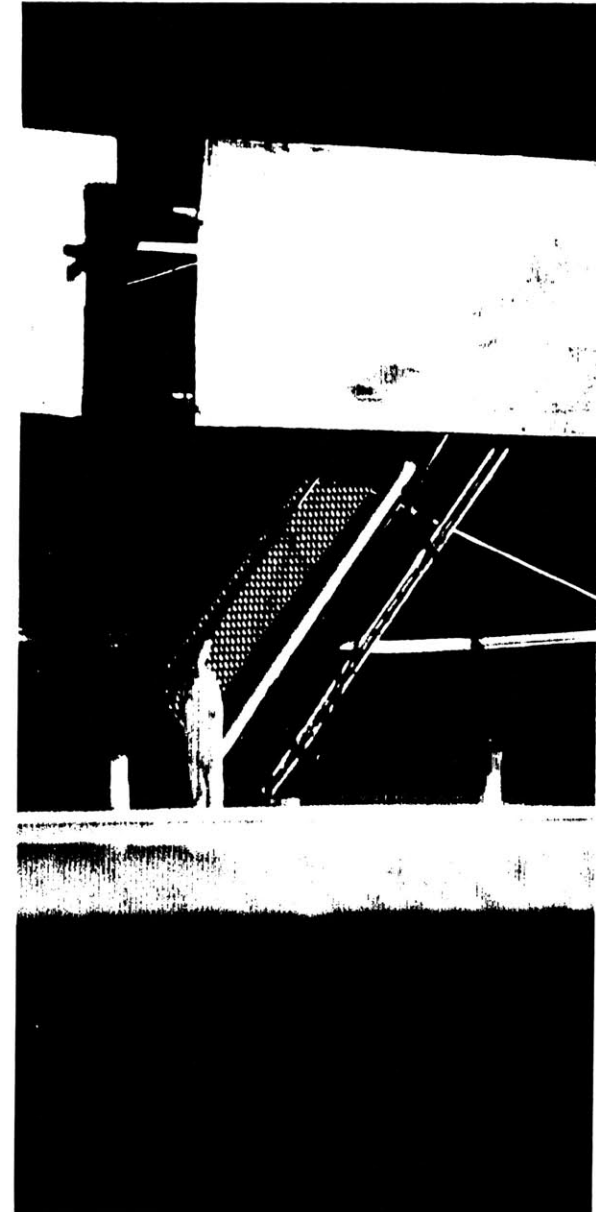
#### *Eiffel's tower and the view of the city*

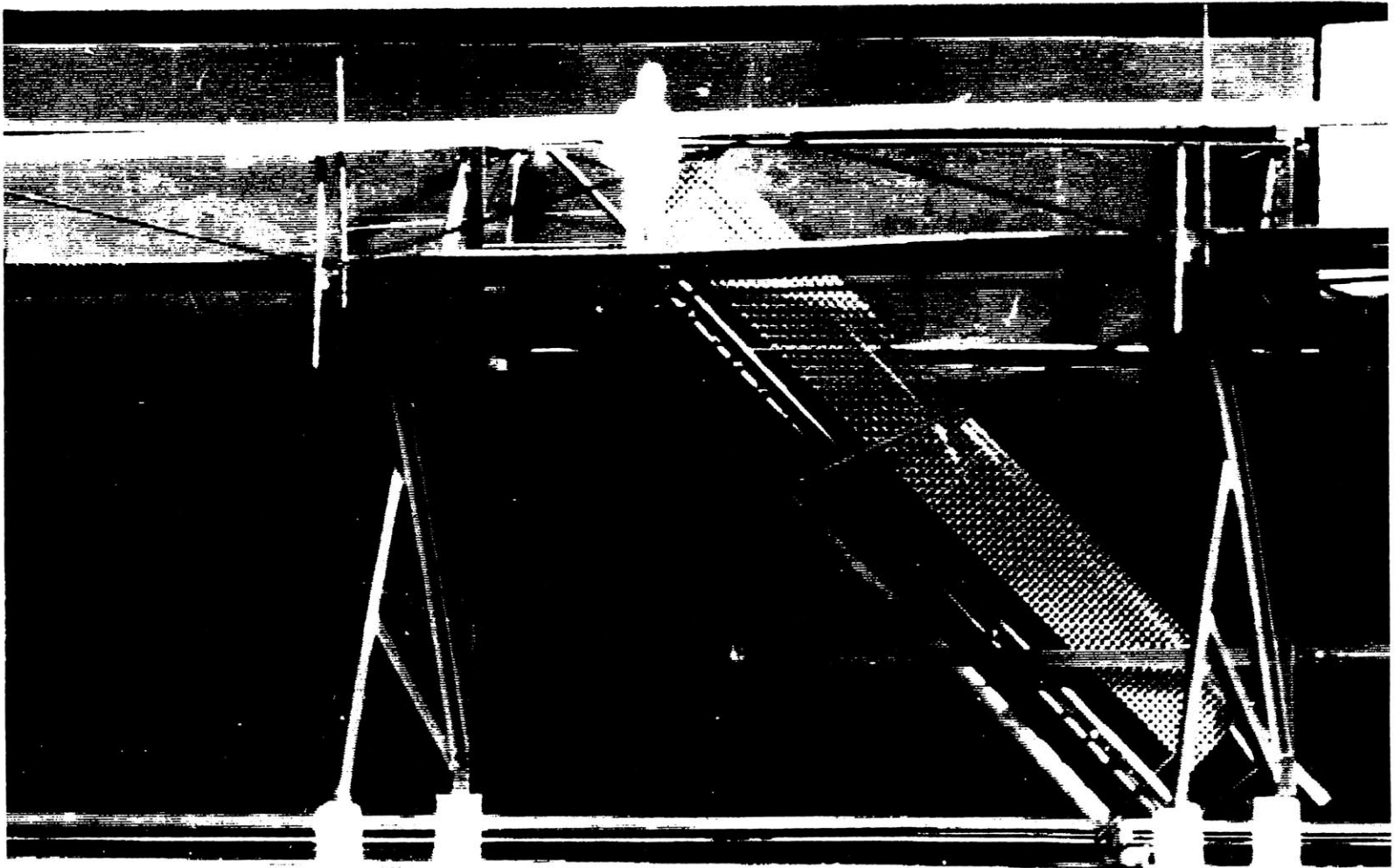
The opening of the Eiffel tower, at the end of the Nineteenth Century, offered a new way to see the city of Paris. From atop this lofty structure, one could see the city from a new vantage point. Streets, blocks, parks, palaces and rivers sat in their proper places in the all encompassing pattern of Paris. The city as a whole became a distanced object to be understood and conquered by the gaze of its citizens.

This tower was the first large scale vertical landmark to be made solely for the public. It was like a piece of the street in the air. Anyone could enter.

Conversely, this new icon became an object that was visible from any from any rooftop. Its power as a cultural symbol was physical as well as intellectual.

What is truly fascinating about the Eiffel tower is how it captured the imagination of the people. It was meant to be a temporary structure, and as it approaches its centennial, one has to ask what made the citizens fall in love with this peculiar structure. It can be argued that the structure was





a manifestation of the spirit of the people, that the structure fulfilled an urban potential, latent in the society. The turn of the century saw a changing world. Machine production was on the rise, and the vision of a freer, more egalitarian lifestyle seemed imminent. With these notions in hand, the tower seemed a common vision of life nascent before the creation of the tower.

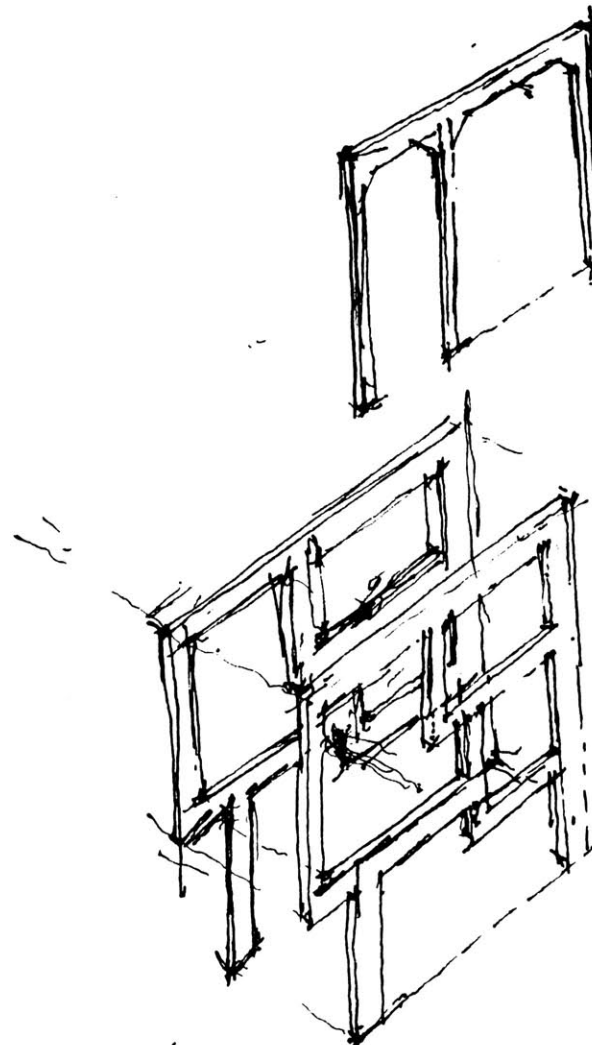
Clearly where these grand ideas of a better lifestyle are utopic, the artifact of the tower is real as are its repercussions on the city.

The point of this example is to stress the importance of urban visions that are not utopias. The goal of this thesis is to put forth an urban vision fashioned out of real artifacts. To this end, many urban notions and architectural agendas will be fastened to this vision to bring about a credible conjecture.

## 1.2 Framing a vision: realizing the idea

The notion of the framework is the establishment of an intellectual construct, which can resolve the many different aspects of the physical project. It acts as a catalyst enabling urban moves while empowering the larger notion of the urban vision.

The framework also acts to physically structure the space of the insertion.

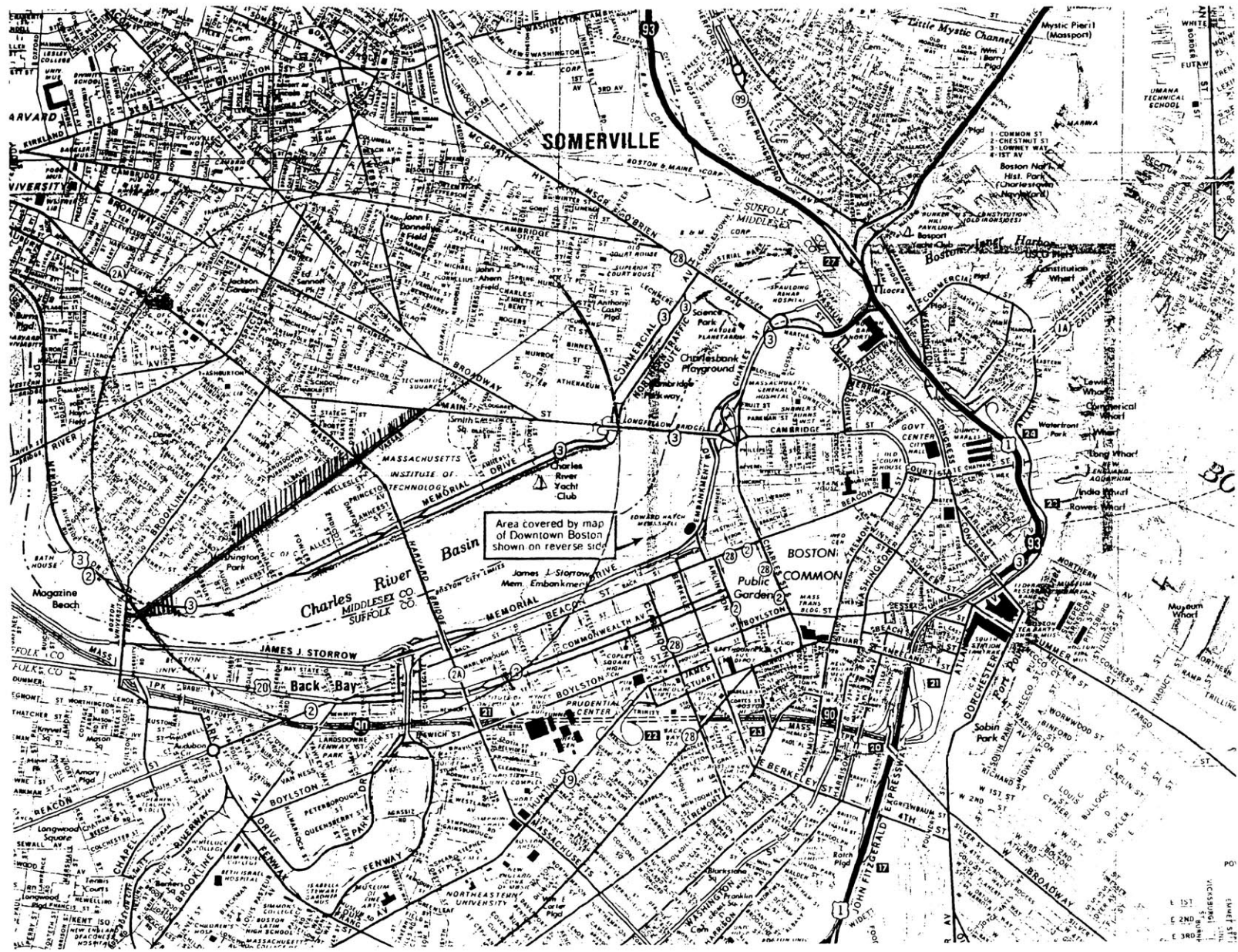


CABLETAL FRAME  
THE PAYS CLEVELAND

WHO WHO ?

THESE FRAMES / GORDONS SEEM TO ADD UP ONLY IN DIRECTION OF

HOW TO BUILD A CONTROL MECHANISM IN THE OTHER DIRECTION.

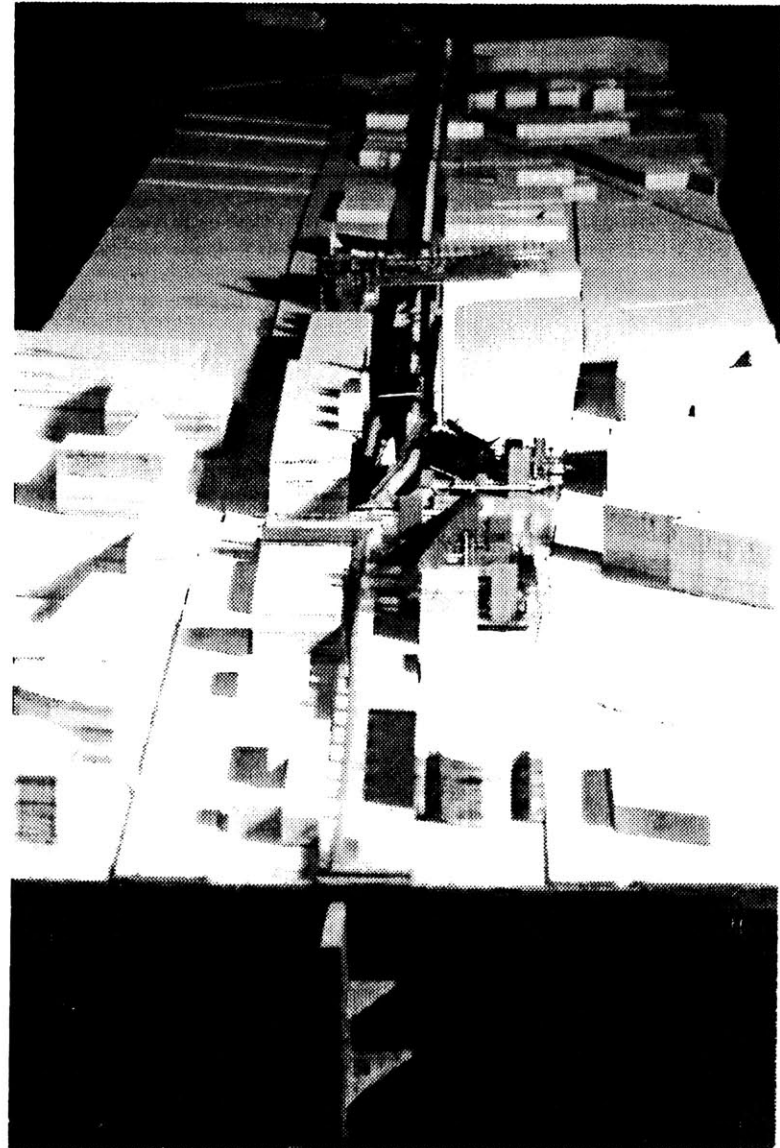


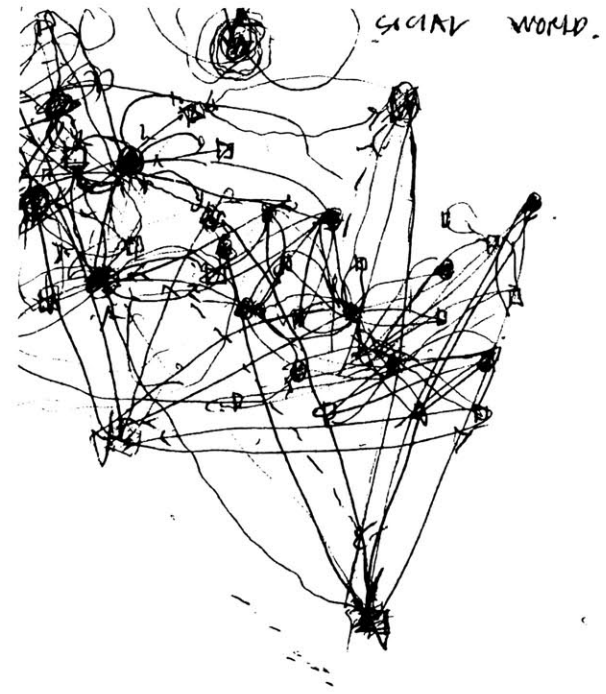
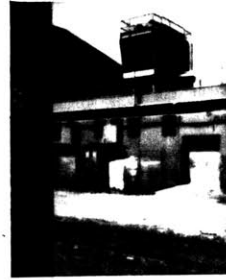
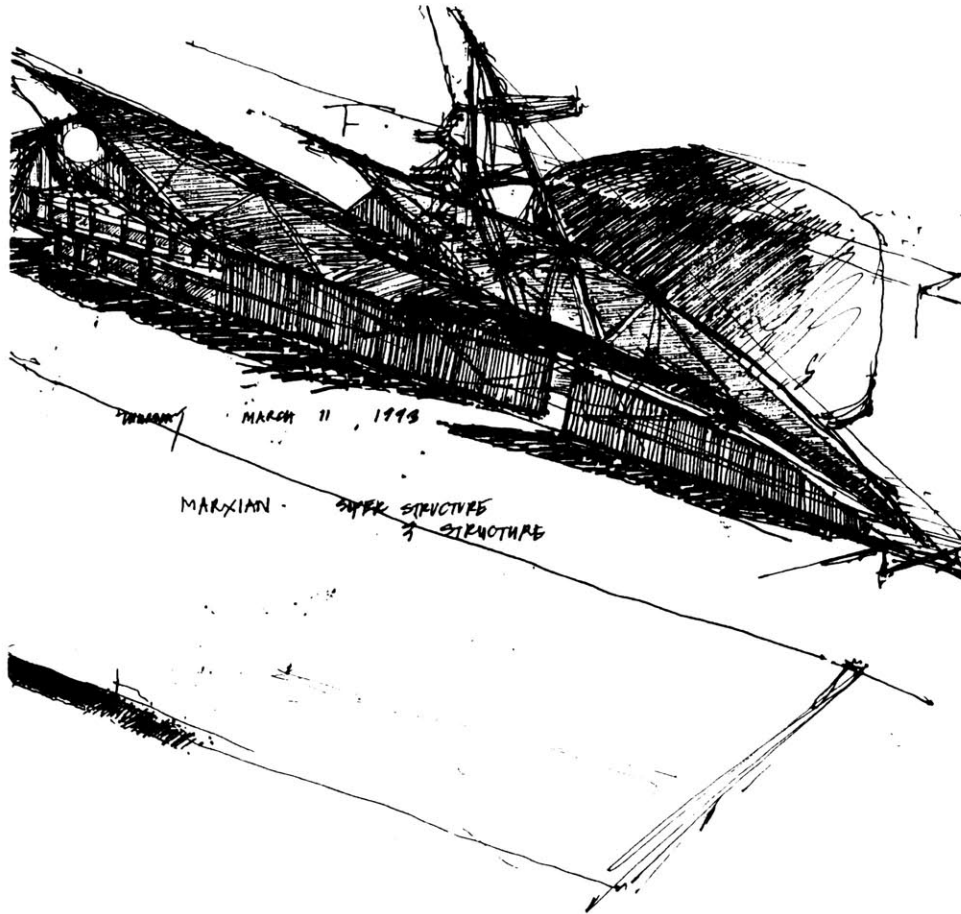
## 2.0 PROPOSITION AND SITE

The site is the railroad right of way zone from the Boston University Bridge, on the Charles River, to Main Street, in Cambridge, Massachusetts. This parcel of land runs across Massachusetts Avenue just to the north of the Massachusetts Institute of Technology (MIT) campus. It is over one mile in length, and generally 60 feet wide. The site also includes vacant lots adjacent to the tracks, specifically those on Massachusetts Avenue and one adjacent to MIT's West Garage.

The proposition is the creation of an urban design out of a vision and the testing the vision against the specificities of the place.

Deeply rooted in this proposition is an approach to the urban design focused more on smaller dimensions. By this process a system develops reinforcing this small scale notion, taking on the program of the site and building the layers of public. The notion is that the urban environment can be designed in ways more empathic to the existing fabric and to human experience.







## 2.1.Larger notions of public (part one)

*Envision a city of openness and transparency.*

The task of the project has been to take these systems or frameworks, and to give them life. The most energetic way of doing this was to wed the notion of fine scale with a vision for the city.

Transparency is a relationship which separates yet allows visual communication. A window, for example, allows someone on the inside to see someone on the outside (and vice versa), yet physically separates them. This notion can be expanded to include a space, acting as the mediator, yet is part of both places. Along these lines of thinking, transparency can be used as an urban tool to open up some of the functions of the city; informing people about their environment.

A transparent city selectively dissolves some boundaries between public and private. By making some private functions of the city visible, the structure of the city is exposed.

At the heart of this openness is society. People live in a city because they want to be in contact with each another. They want to communicate with one other. This notion of openness already exists in society because they want to exchange ideas. The proposition is to reinforce this notion with physical form.

The framework's goal is the enforcement of this idea in the physicality of the additive pieces and in the site's program.







## 2.2 Architectural agendas In Urban Design: Frameworks (part two)

*Walk down the tracks and think about the city.*

If the quest of architecture is to make places for people, it seems logical to try to start with pieces on the scale of immediate human existence, and build from these larger, more urban ideas.

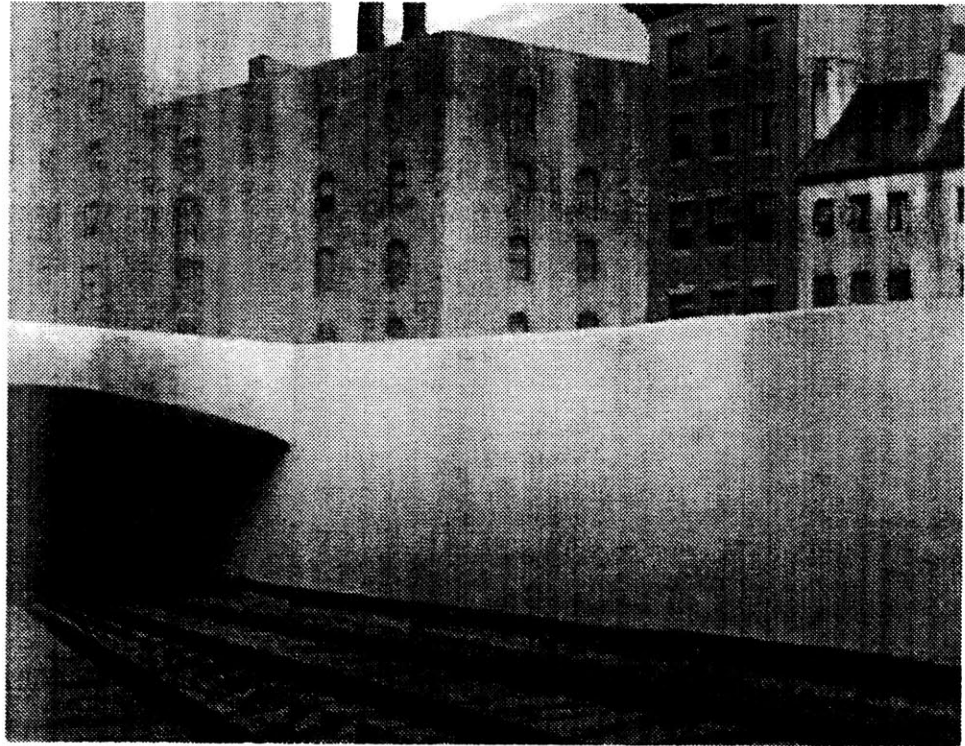
### 2.2.1 Place

The city was once sliced open by the will of a steam engine trying to get to the center. Ever since, cities have turned their backs on these places.

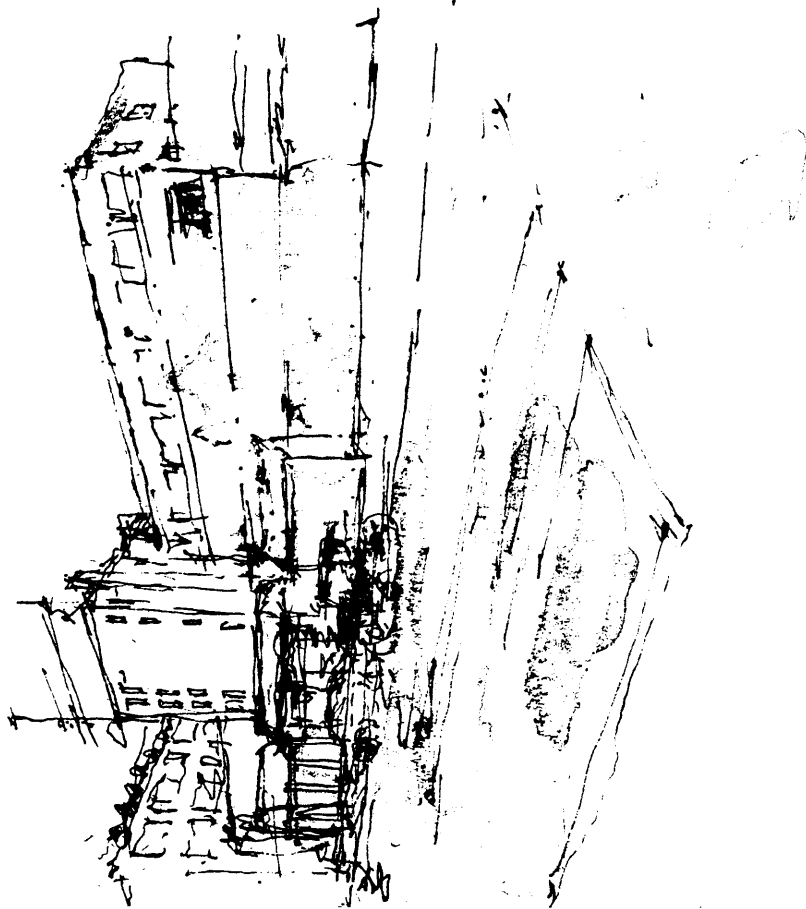
Walking along the site's tracks, one feels the urban isolation. This rail corridor is the back door to all of the surrounding labs and office buildings. Traffic is not heard here. Trees, weeds and grasses grow wild to the sides of rails. No windows look out into this space. To many this is a non-space.

The potential of this place lies in it being a non-space. It is thought of as a negative barrier, and a positive intervention will provide a sharp contrast in the minds of the people of the city. It will be a place where there was once nothing.

The intent is not to erase all the existing qualities of this place. The feeling of isolation can be exploited to make part of the site an oasis in the city accessible to everyone. This notion also works to allow the vision of transparency to exist as an anomaly in the city.



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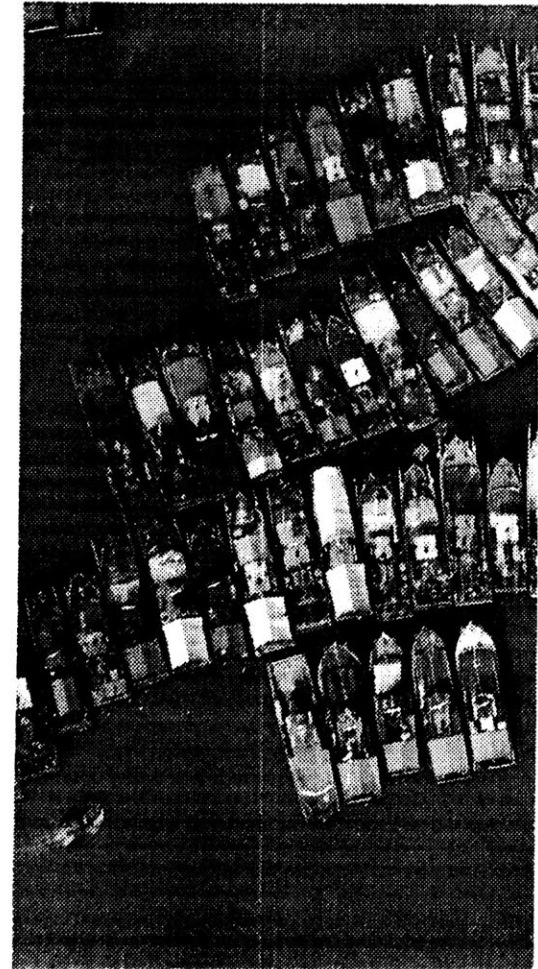


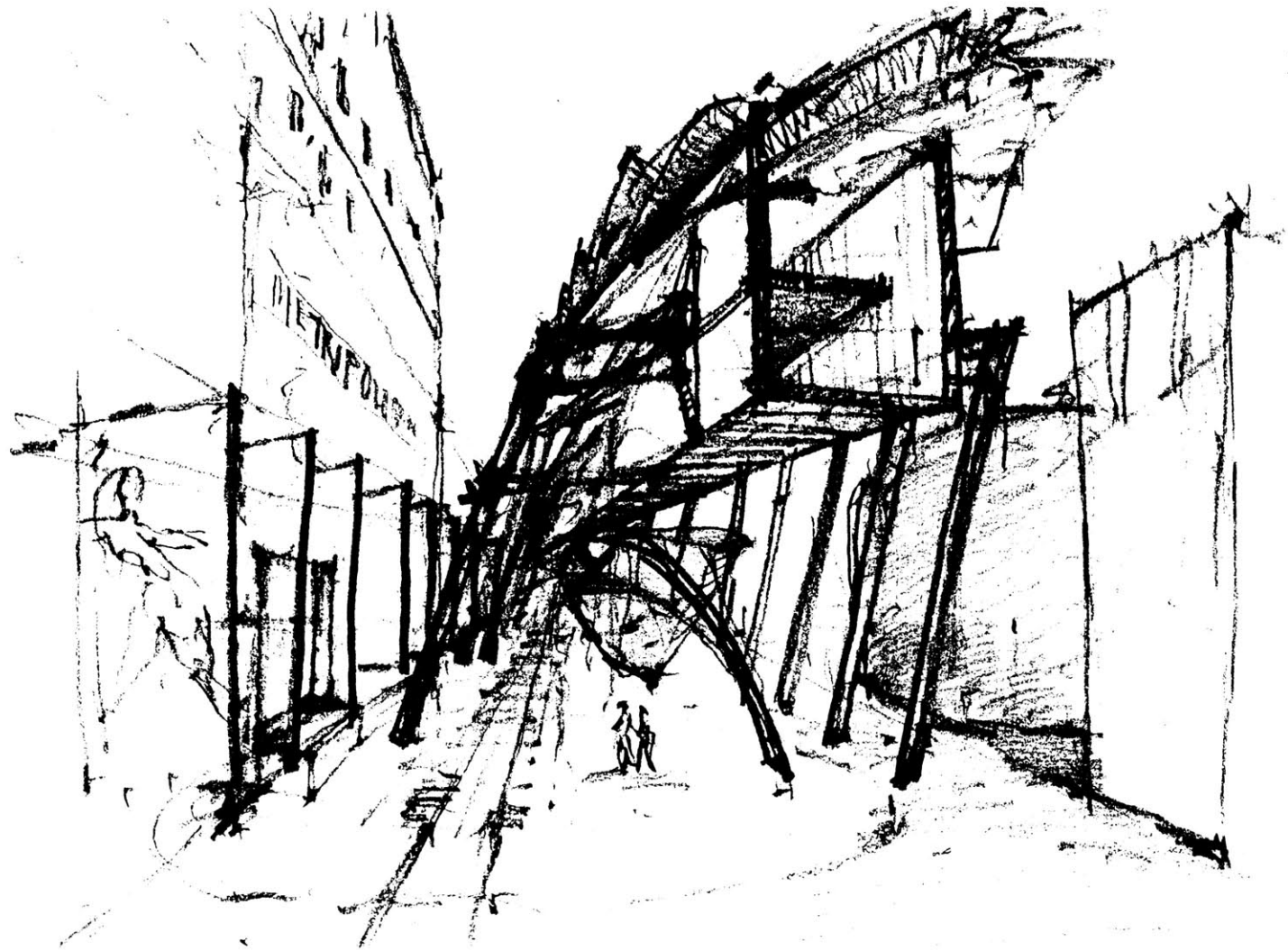
The scale and location are equally important to its potential. It is a long urban corridor. MIT connects to the river through it. It is less than two miles from the center of Boston, which is only twice its length. The site is large enough to make a serious contribution to the public aspect of the city.

The issues of the specific place are a layer of concern, which the framework must support.

### 2.2.2 Pieces

The urban fabric of the neighborhoods, especially in Cambridgeport, was essentially a piece-meal development whose character was determined by the lot sizes. The belief is a method of designing an urban environment can take on some qualities of the existing city by being made of pieces. Starting with small pieces, on the scale of small buildings, and aggregating them is a first step towards trying to achieve this. Another step is to use the dimensional texture of the neighborhood to design the urban project, such that the making of the large pieces would be an assembly of smaller pieces at the scale of the neighborhood.





### 3.0 ISSUES AND METHODS

#### *Urban and architectural*

Throughout the thesis the author has attempted to coordinate a variety of issues, all of which were explorations.

1. Urban vision
2. Urban attitudes
3. Architectural layers of use and continuity
4. Synthesis

#### 3.1 Urban Vision

The largest scale issue explored is rethinking what urban environments are and what they can be. The desire to change people's perception of the city has been the intellectual backbone of the entire project, and in many ways has been a spring board for the architectural and urban agendas.

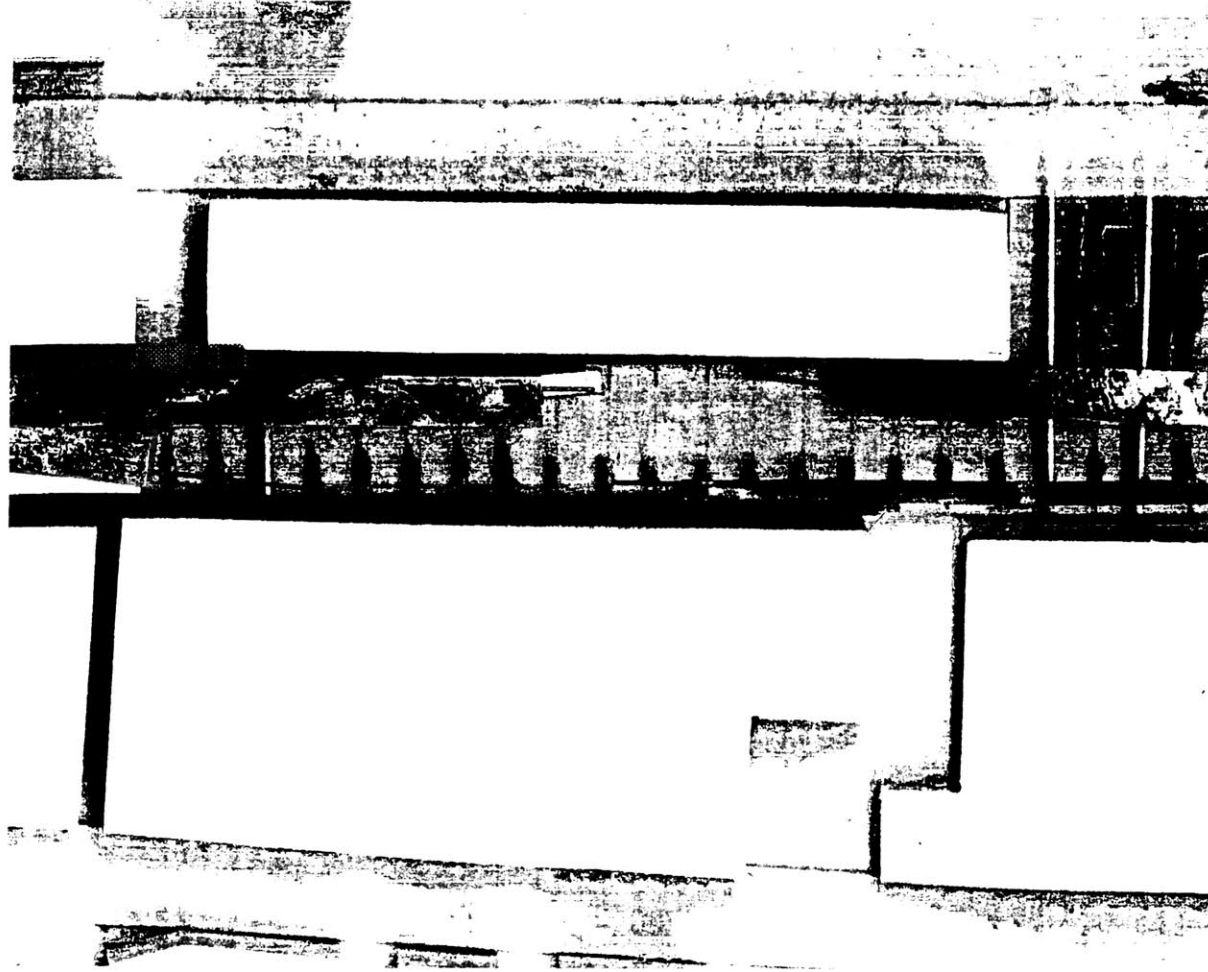
##### 3.1.1 Viewing the city

The notion of transparency is a theme that runs throughout the project. On the highest level, an attitude of openness is making the city more public. It is an intellectual proposition, and not purely physical.

##### 3.1.2 Public space at the scale of the city

Early in the thesis production, a proposition arose of constructing a mechanism that would not only change people's perceptions of the city,





but also would act as a very large public space: one that could compete with Boston's Esplanade (which it connects to at the river). The reasons for this are twofold. The first is the sheer dimension of the site ought to be preserved in a manner suitable for large public use. The second also has to do with the city on a less tangible level. The notion of this transparency in the city, by its different nature, needs to be in the realm of the most inclusive group, the city as a whole. Because relooking at the city is informative its publicness is crucial.

### 3.2 Urban Attitudes

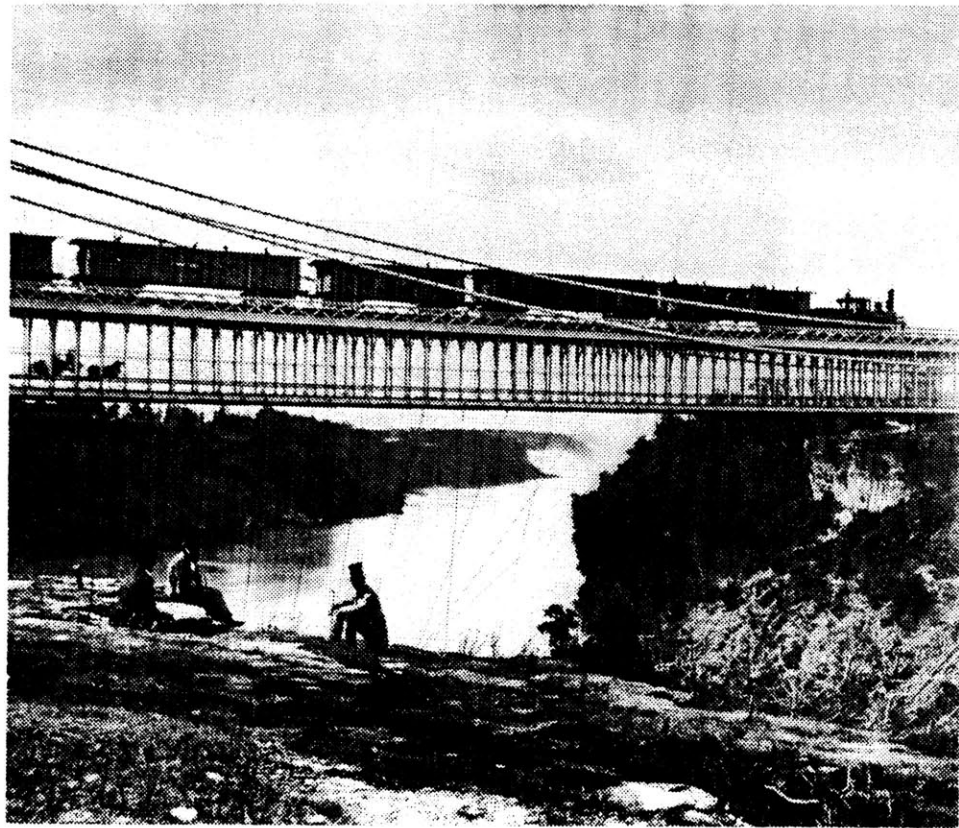
A goal of this project was to make an intervention that improves the life of the city. One way is to provide a new way of experiencing the city. Other ways of improving the city rely on making this a place and connecting it to the city.

#### 3.2.1 Scales

##### *Largest scale*

Because the site is a man-made incision into the fabric, it is interesting to think that this intervention of separation could be used to bring together things. By reinforcing this large dimension and subtly connecting it to the city, the project will bind the two sides of the urban fabric, without compromising the qualities of the site.

Ideologically, the great dimension is built through the physical coherence of the urban vision. Throughout the site this idea's physical reinforcement is the legibility of the project as an insertion.









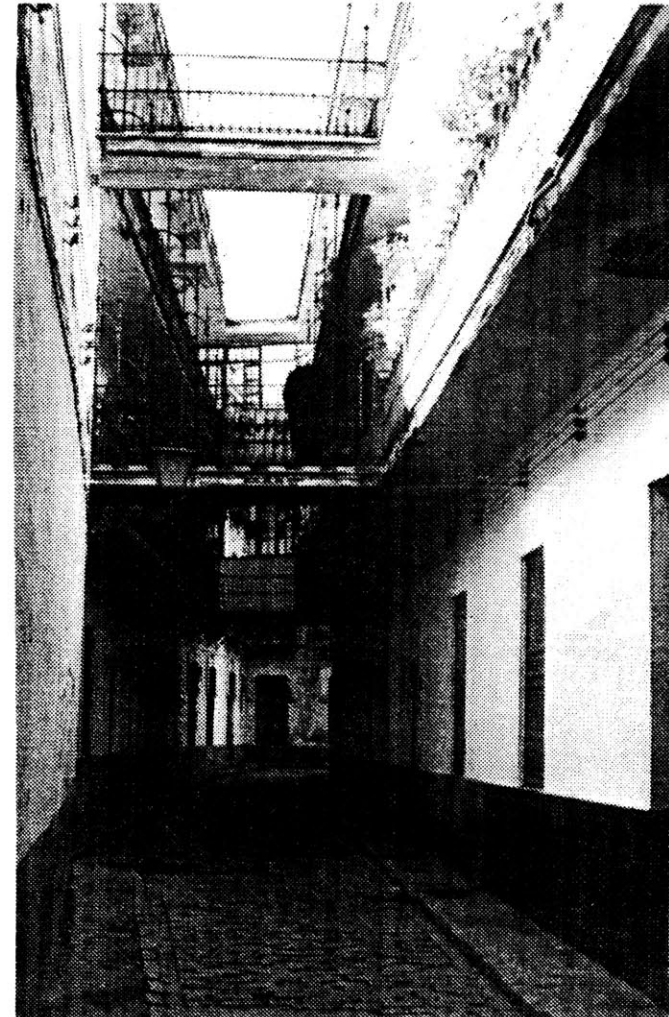
#### Smaller scales

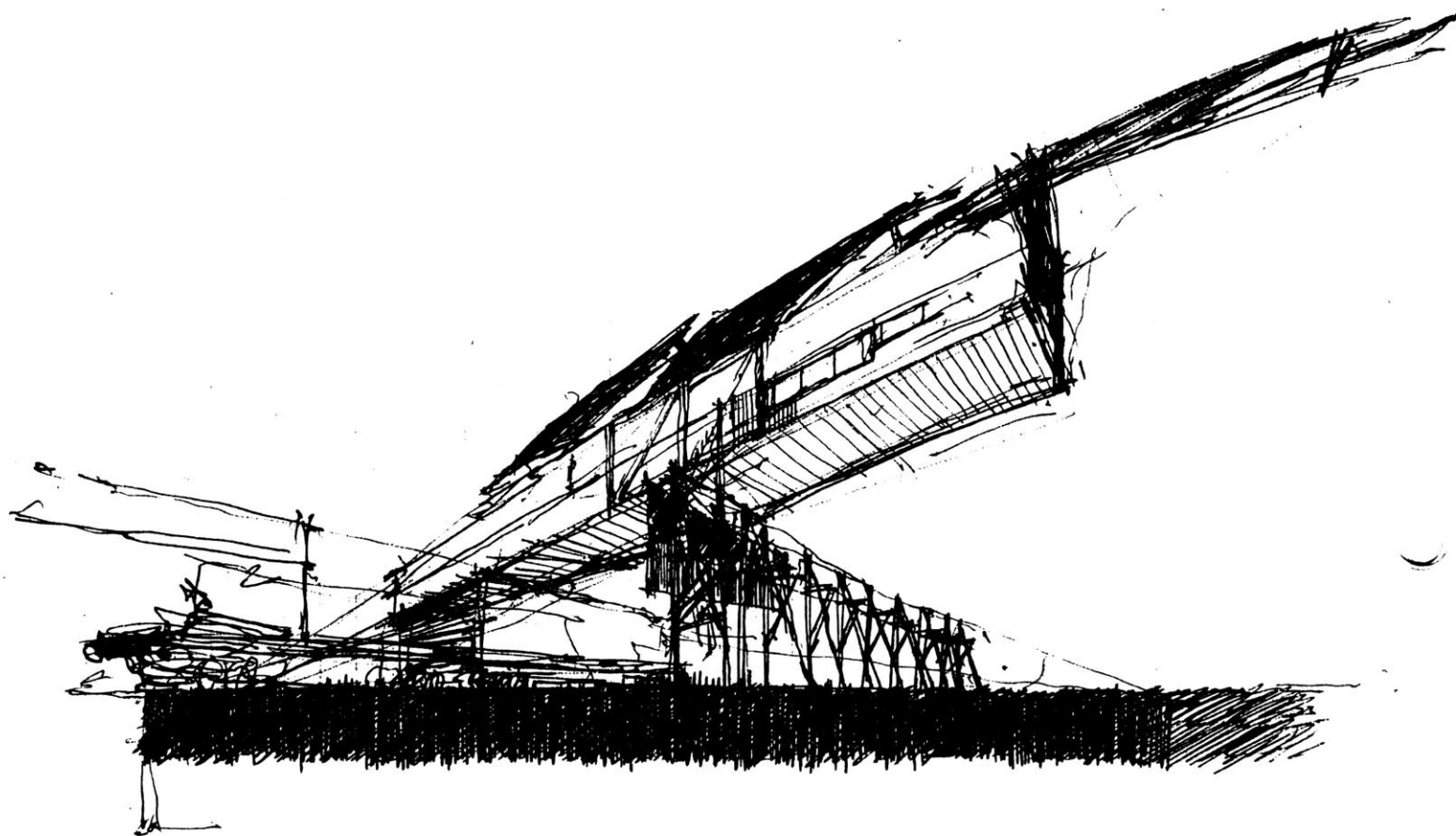
Other ways of reinforcing this largest dimension involve using smaller scale pieces to aggregate the large moves. These pieces may be on the scale of long buildings (around 600 feet), or they may be pure framework aggregations. The frames function to mark the site in a legible matrix, into which everything sits. This metering of the site provides a physical continuity. The long buildings work to provide a middle size between the entire site and the scale of the frame aggregations.

The assumption is that this layering of scales in the urban environment is a positive quality of cities. That is, the inhabitants of these places appreciate the different ways in which they relate to the earth (person to neighborhood, person to district, and person to city, and on and on) and that through these relationships people make a psychological claim to the city.

#### 3.2.2 Urban Connections

It is important to consider the urban fabric around the site as being discontinuous because of the railway. This discontinuity is important because it allows the intervention to be a public resolution of the fabric. Instead of the blocks turning their backs on the site, it can now become a place for the surrounding areas to come together. One method of making this a public place is connecting it to the city. The city is both the adjacent neighborhoods and the whole metropolis.





*Neighborhood connections (physical)*

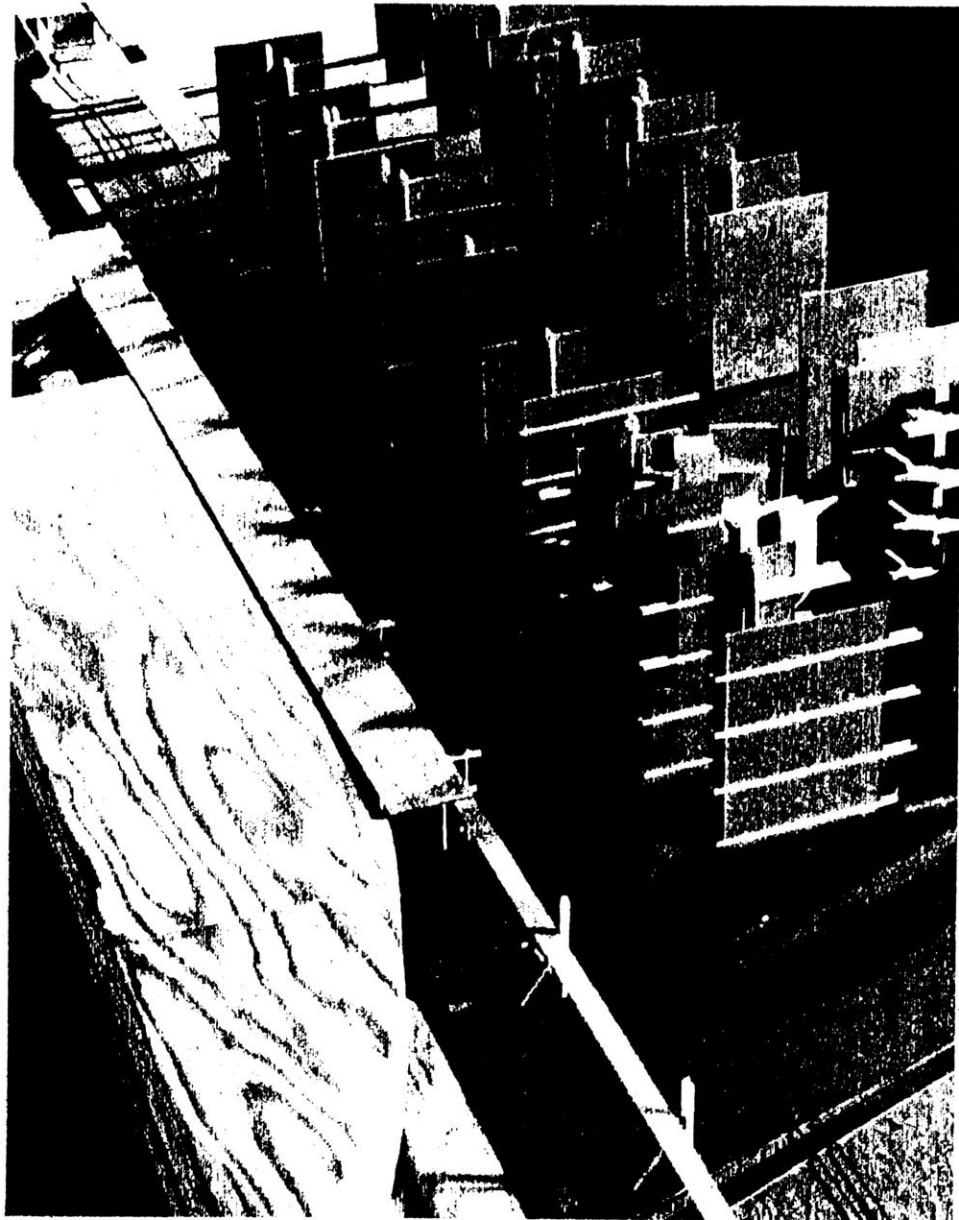
Physical access is essential to the making of any place, and it is paramount in the making of public places. Since the project is to be public, many levels of physical connection to the adjacent neighborhoods are necessary.

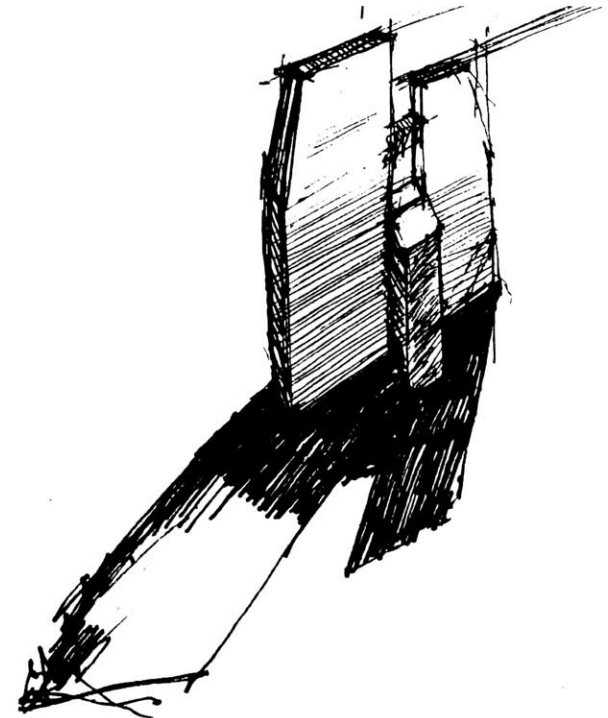
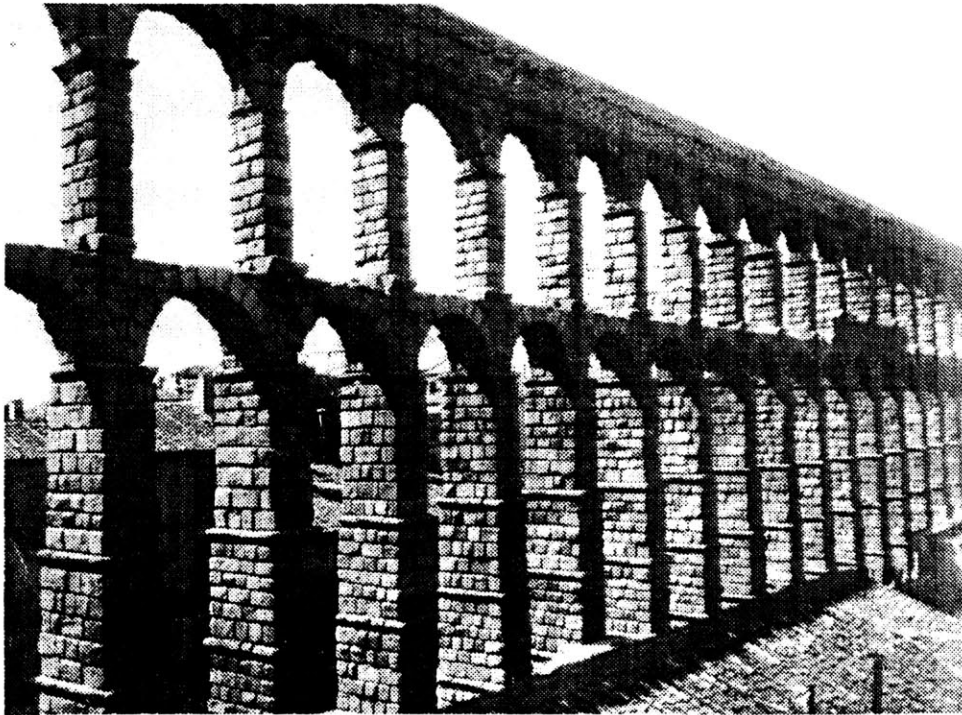
The site is psychologically severed from the city. Only one path crosses the entire length. There is no memory of use on site, except as a train yard. If one considers cities as inertial bodies that do not want to change their use patterns, then it is necessary to build strong reasons for the change.

A first step is making the site accessible. The streets surrounding the site, with the exception of Massachusetts Avenue, do not cross the site. Fences keep pedestrians from crossing the tracks. The extension of Pacific Street and Putnam Avenue across the site will connect Albany Street to Vassar Street. By bringing traffic across at various points along the length, a sense of the fabric connecting will be reestablished. These extensions also divide the site (from Mass. Ave. to the B.U. Bridge) into three roughly equal pieces. Each piece is between one and two lengths of a long block in the South End of Boston (800 feet). This neighborhood reference is meant to be a dimension that ties the pieces of the site to existing patterns in the area.

*City connections (perceptual)*

Connections to the metropolis are more visual and symbolic. Primarily the river end of the site is where the project makes gestures to the larger public. This is achieved through the forms of the anchor at the river end. The program of this





building (which is an orientation center for the site) knits together the physical connection of the site to the public river basin and the intellectual connection of the city to this corridor of technology. By its position, this piece acts as a gate to the site and its urban revelations.

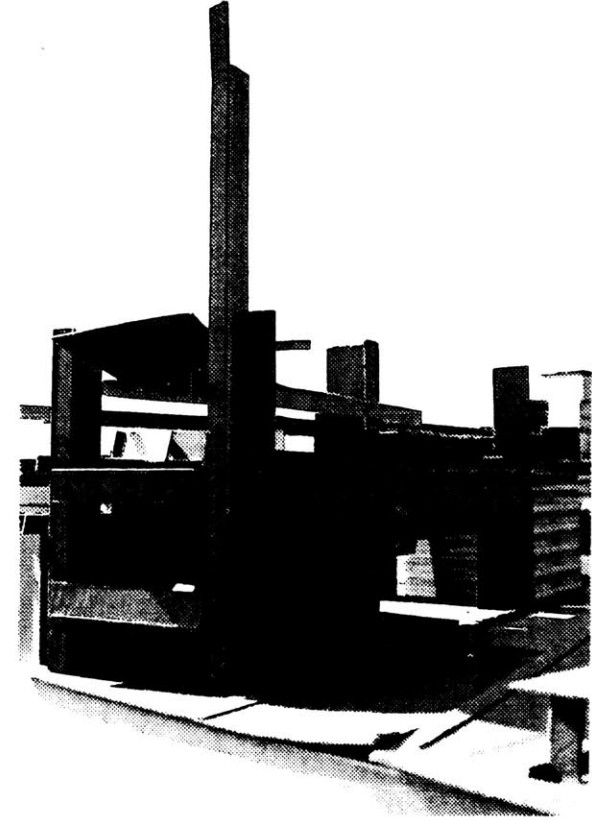
### 3.2.3 Institutions and other public spaces

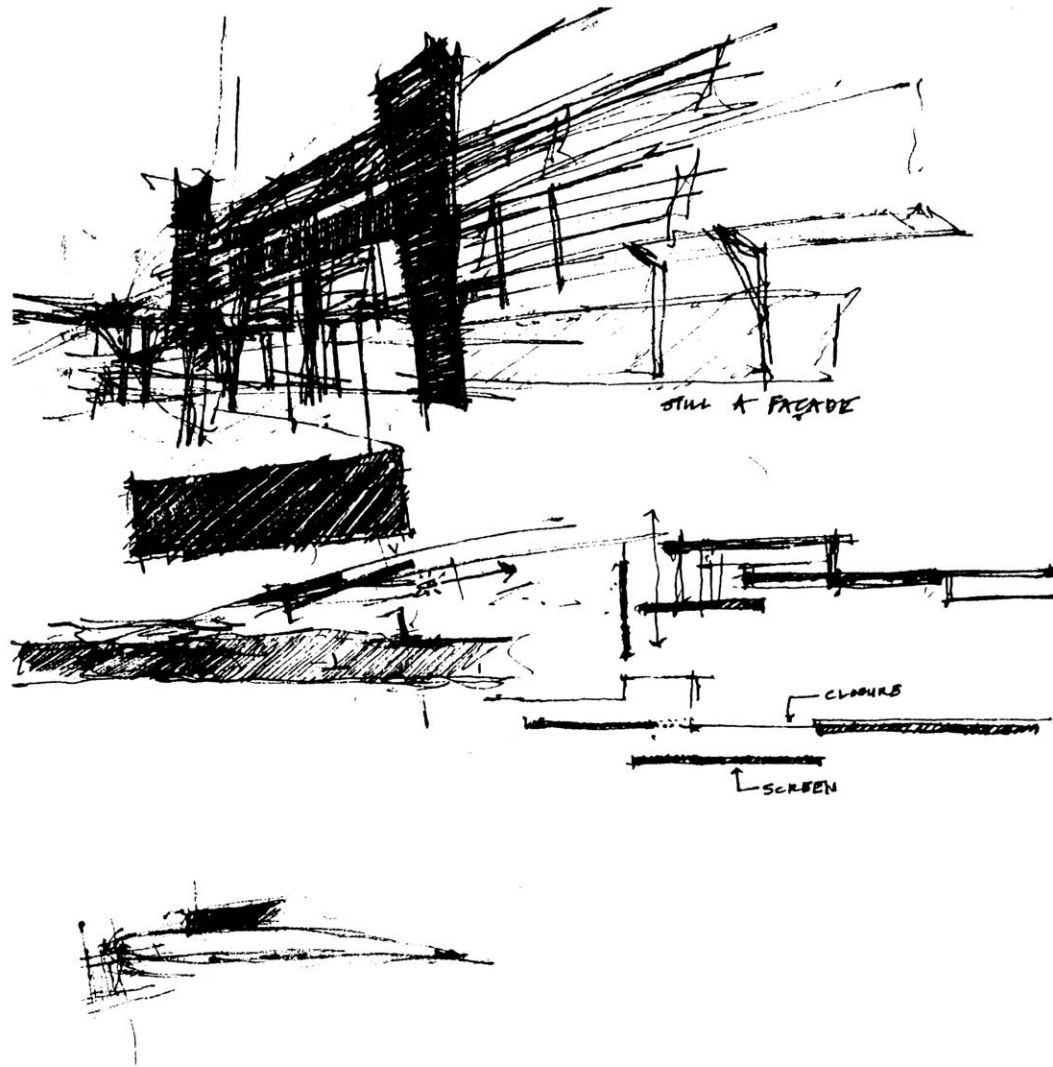
If this urban intervention is to become a part of the city, it is necessary to provide a reason or activity for the intervention. Institutions along the length act as anchors to this activity. The institutions will be associated with small public spaces. This is another level of breaking down the scale of the site. Though empathic to the existing fabric because of its uses and connections, these institutions are directly connected to the larger notion of the site as an urban paradigm because of their positions in the rail corridor.

### 3.2.4 Infrastructure

Architectural infrastructure is the notion of more permanent forms which psychologically anchor the project and its intentions.

This intervention provides strong forms to maintain the site's long direction. It also deployed in a manner to prevent the long site from disappearing. The infrastructure is part of the framework, and functions to add the critical amount of permanence to it.





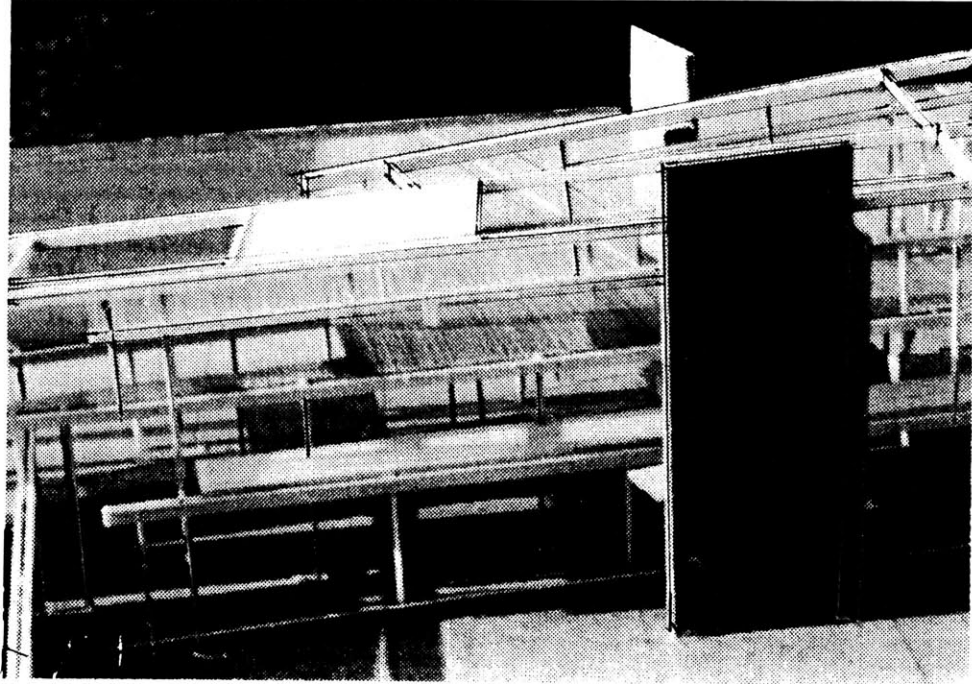
### 3.3 Architectural layers of use and continuity

In a sense the project can be thought of as one large building. The notion of transparency shifts the attitude of architecture from objects to the idea of a more complete environment which is perceptually accessible to everyone. One can see into all the public spaces. This also implies varying degrees of closure, such that one can experience analogous understanding of space regardless of whether one is inside or outside. The infrastructure and the frameworks act to make these definitions. Therefore, one can think of the project as a thematic exploration of transparency which provides continuity (physically and perceptually) to the project by this theme.

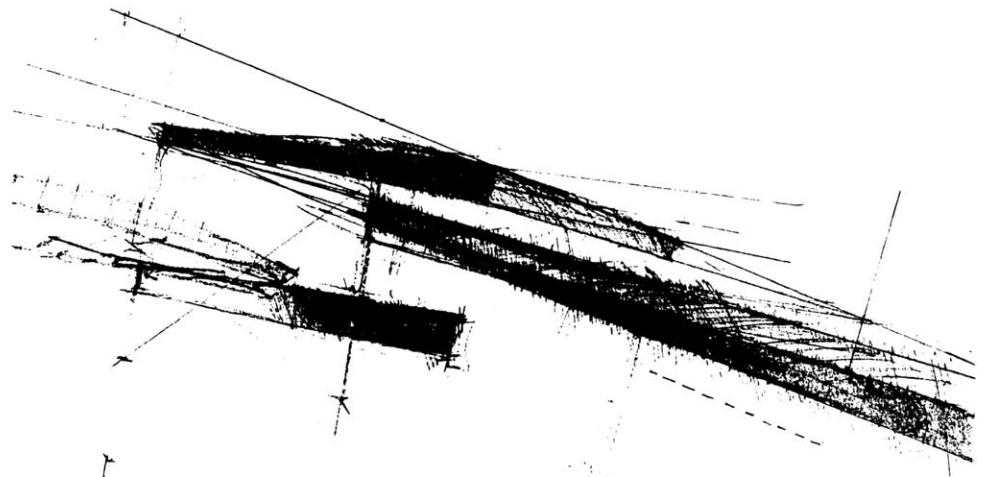
#### 3.3.1 Frames

The physical aspect of the framework is the frame. The frame is a transparent piece that orders the site through repetition. The frames are deployed in a linear fashion at a spacing of 25 feet. They act to build the large dimension through an addition. This dimension is width of a row house in the Back Bay and is the length of a common concrete structural bays. These references are meant to tie this dimension to existing spatial understanding.

In extended use, these frames can work to add another level of legibility to the vision of the city. They are transparent. The collection of them structures the urban vision by its physicality, which one can mentally extend to the rest of the city.









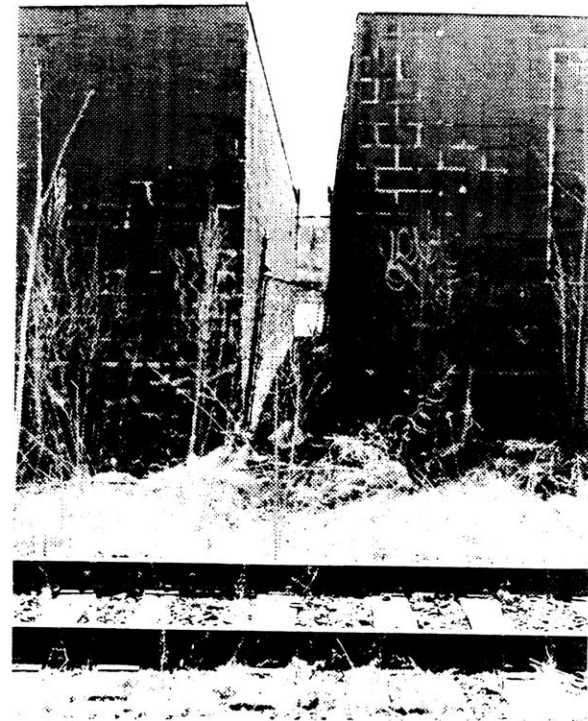
The frames act as the middle ground between the privacies and the public corridor. It is the frames that provide a structure for the existing labs to grow into, and in the dimension of the frame, allow the labs to make the largest and most public space in this frame.

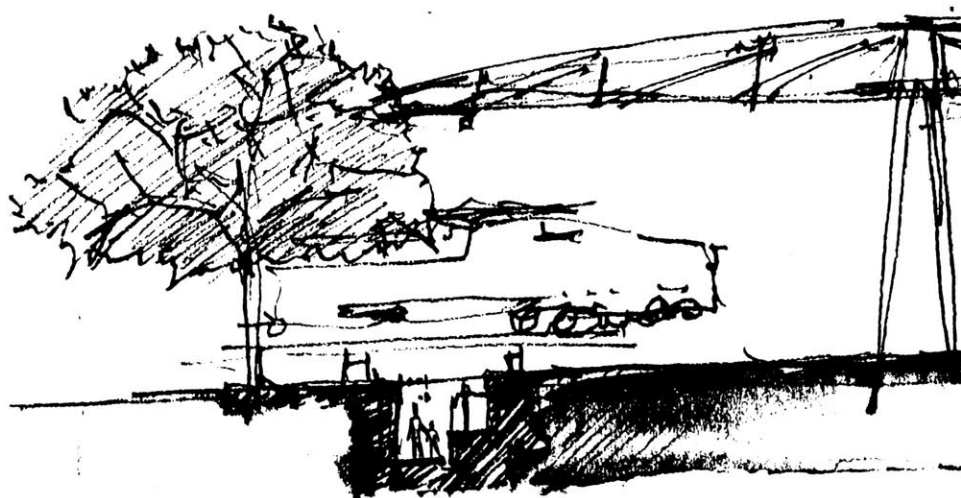
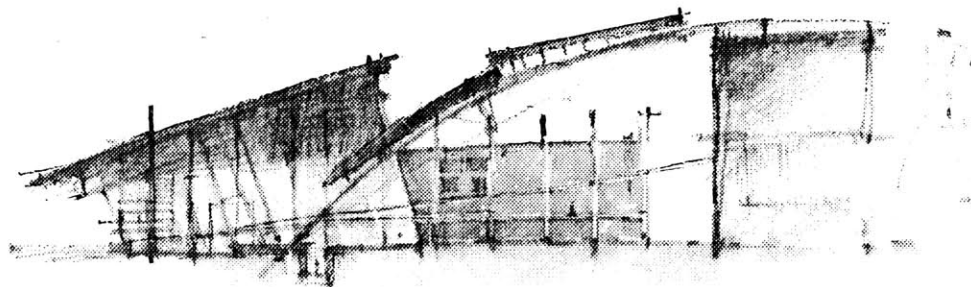
### 3.3.2 Corridor context

The urban issue of connection to the adjacent city needs some architectural reinforcement. This connection is made by bringing the project out into the fabric, as in the extensions of the frames. Conversely, the fabric must be brought into the project. The building of the corridor context is an extension of the current neighborhoods onto the site. This provides a building of more corridor walls. It also allows the opportunity to build adjacent buildings which address the corridor in a positive way.

### 3.3.3 Thin buildings

The thin buildings are another layer of framework which works on the next scale up. Using these larger blocks of buildings allows for public functions to occur in the zone of the tracks, and not solely around it.





### 3.4 Synthesis

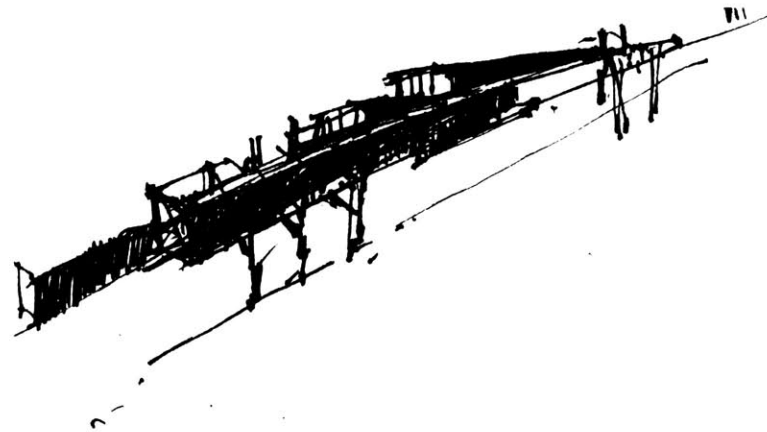
The synthesis of all these issues is the crux of the design problem. The urban issues raised played the part of providing a "program" for the site in the context of the city.

#### *A compatible alternative*

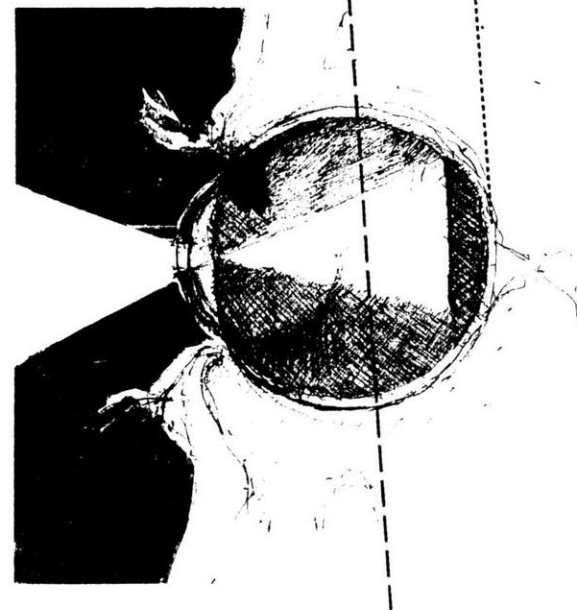
The notion of an alternative way of seeing the city and an alternative way of designing appears at odds with the urban fabric. The project is not a continuation of the fabric untransformed, however it is a reinterpretation of this fabric, which adds another layer of publicness to the neighborhood.

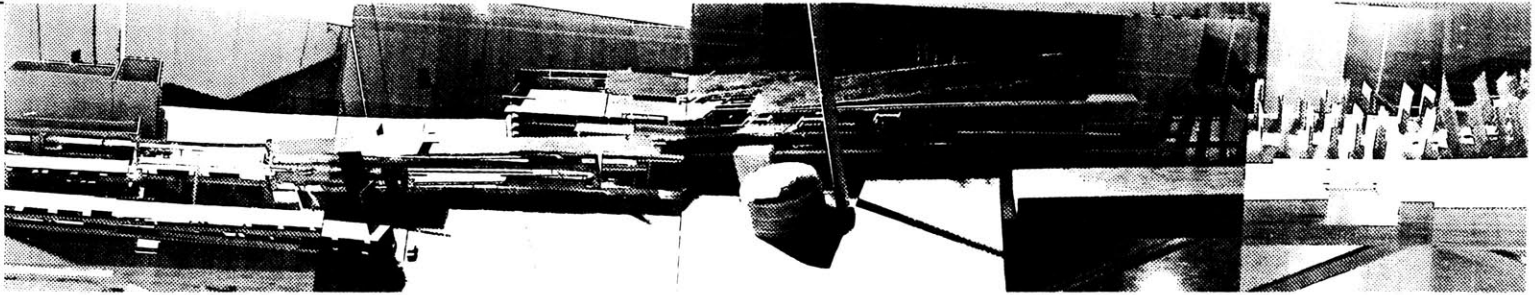
The concern of the publicness of this place reorients the surrounding city. This reorientation is important because it makes one look at the "context" in ways that are dynamic and it poses the question that the project is itself context. This kind of thinking also demands that the project be tolerant of the city.

In many ways, the project has been to balance the notion of an urban vision with the existing city.

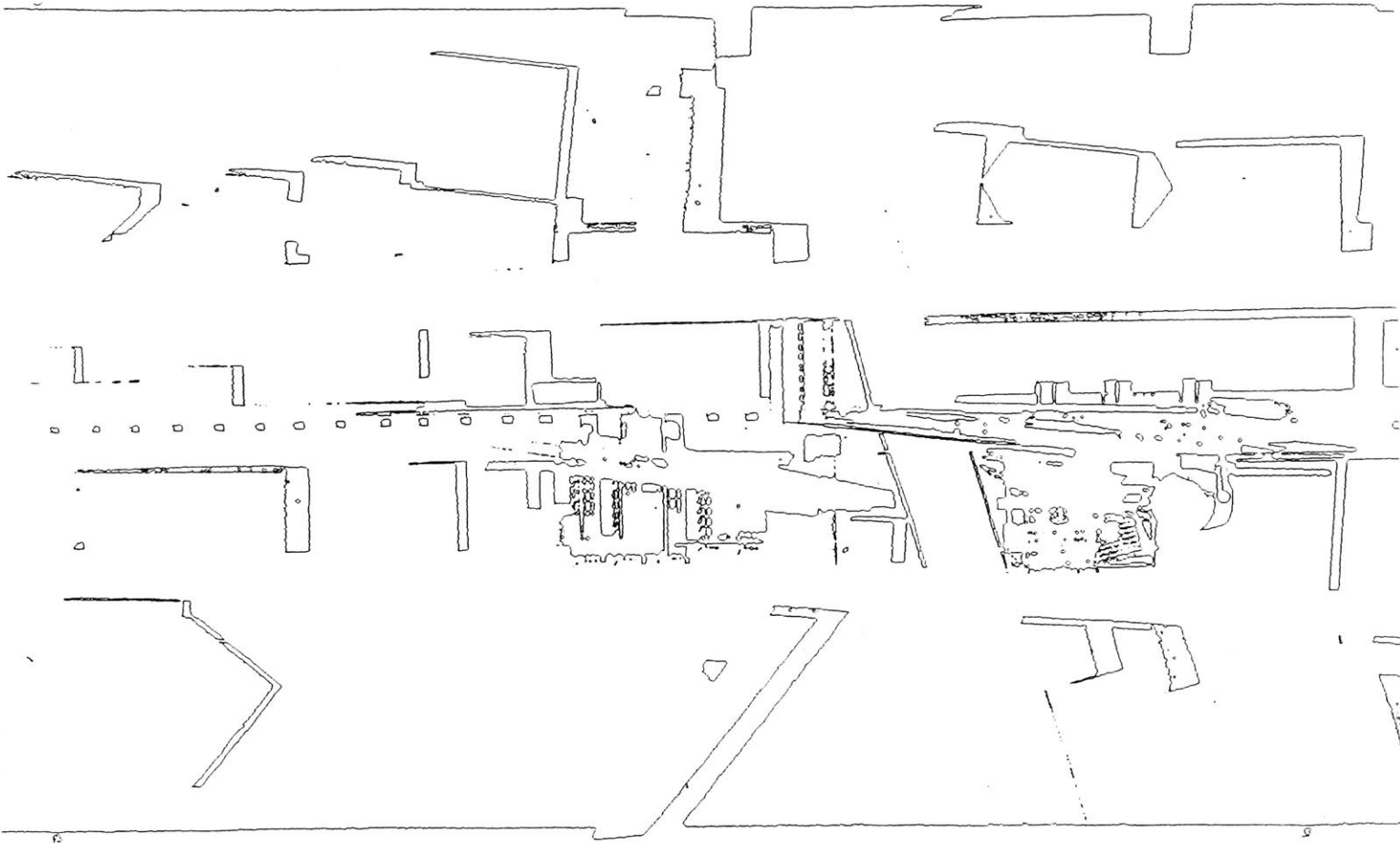




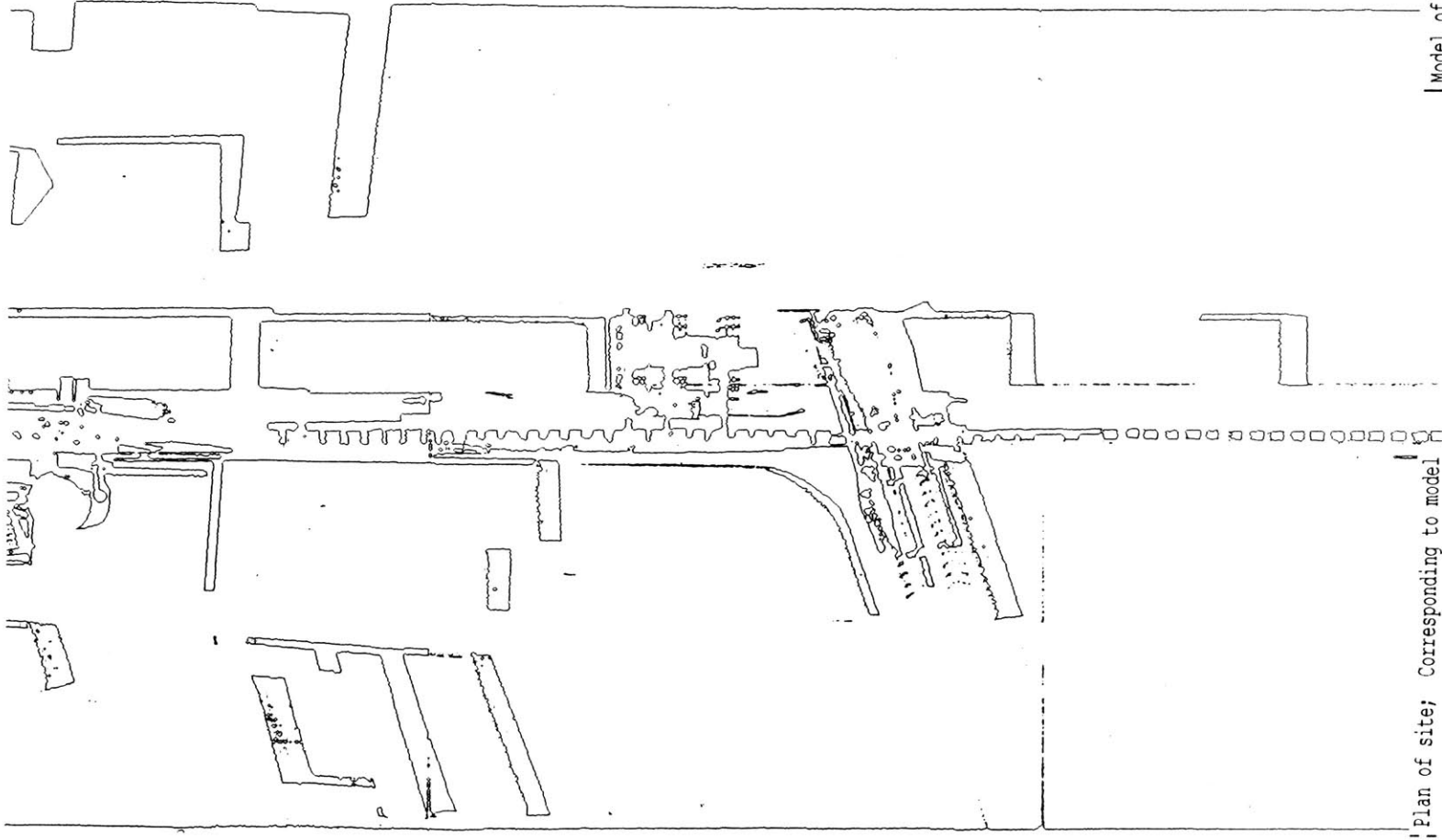




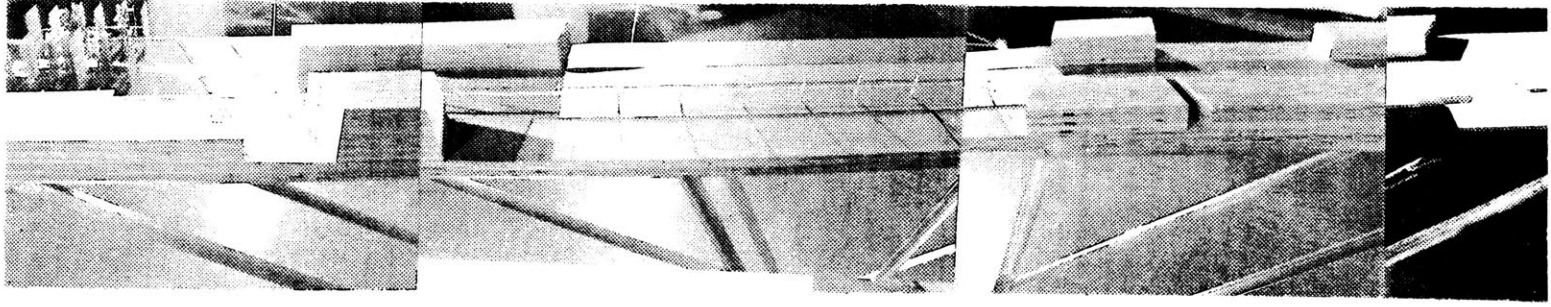
Model of site; Mass. Ave in center



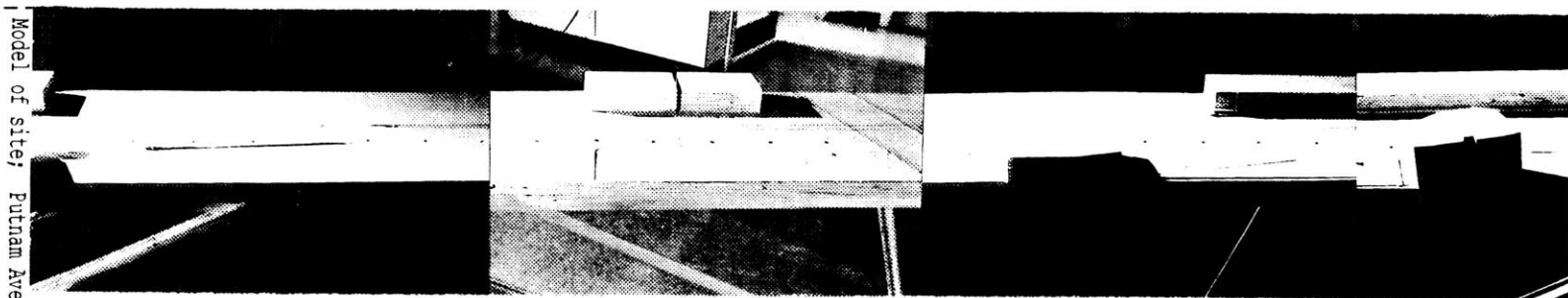
Plan of site; Corresponding to model



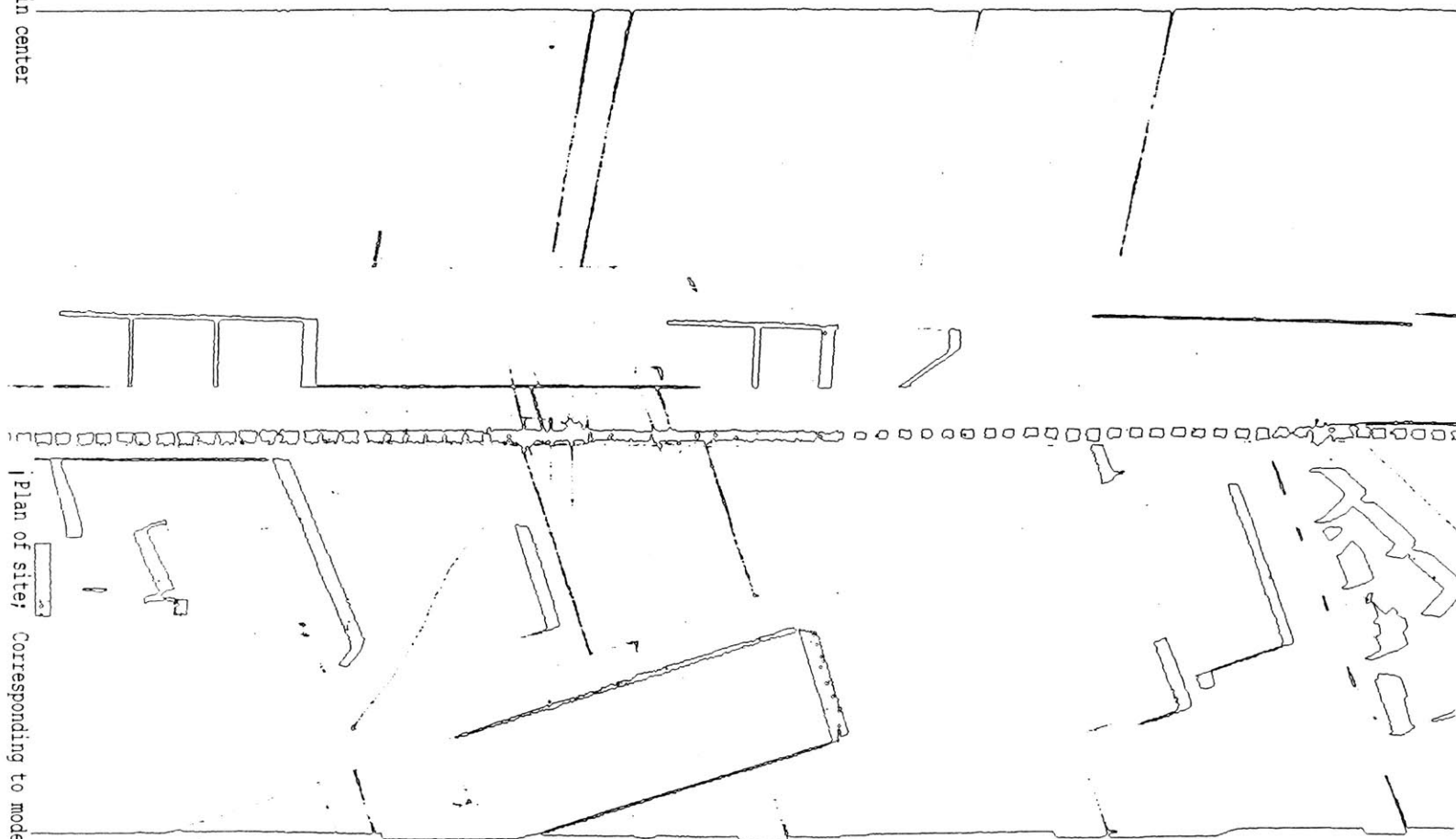
Plan of site; Corresponding to model



Model of site; Pacific St. to the left

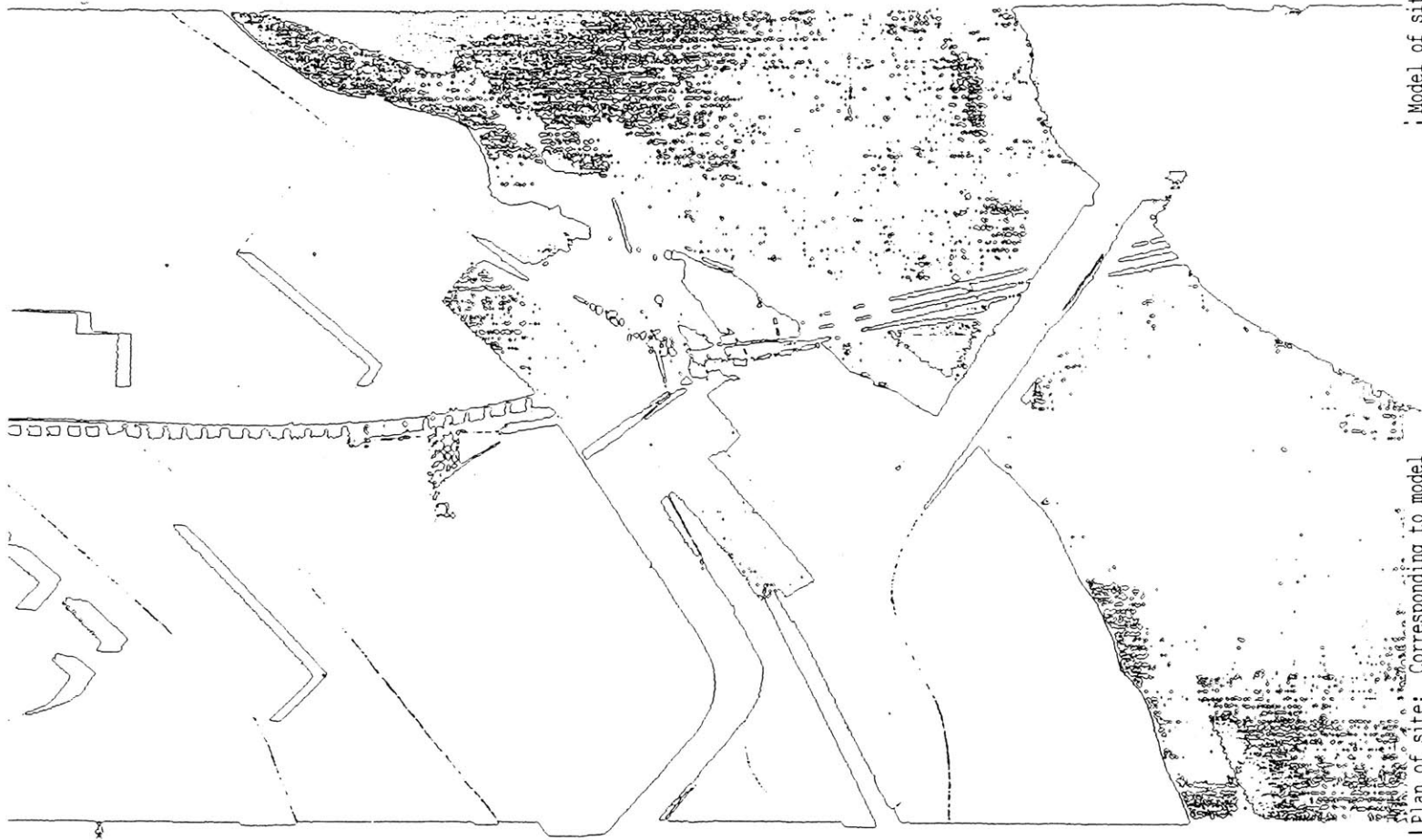


Model of site; Putnam Ave. in center

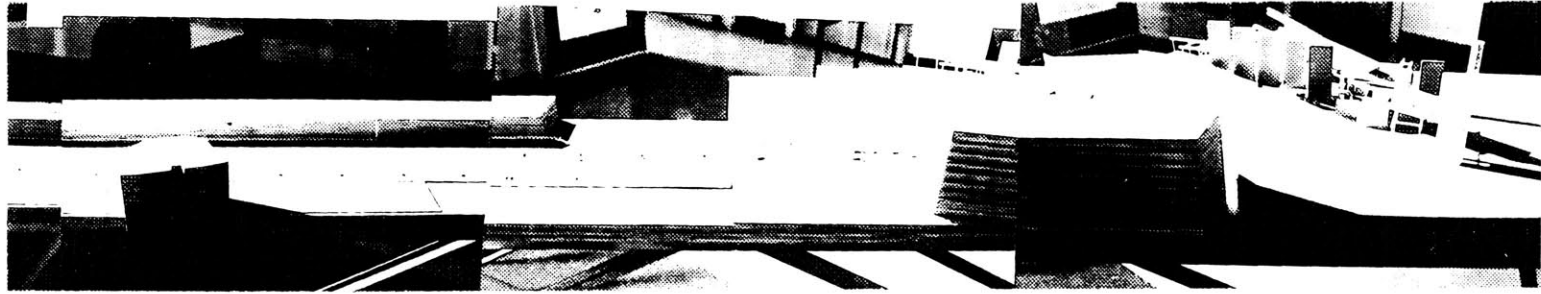


Plan of site; Corresponding to model



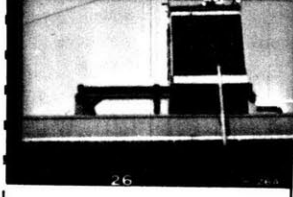


Plan of site; Corresponding to model

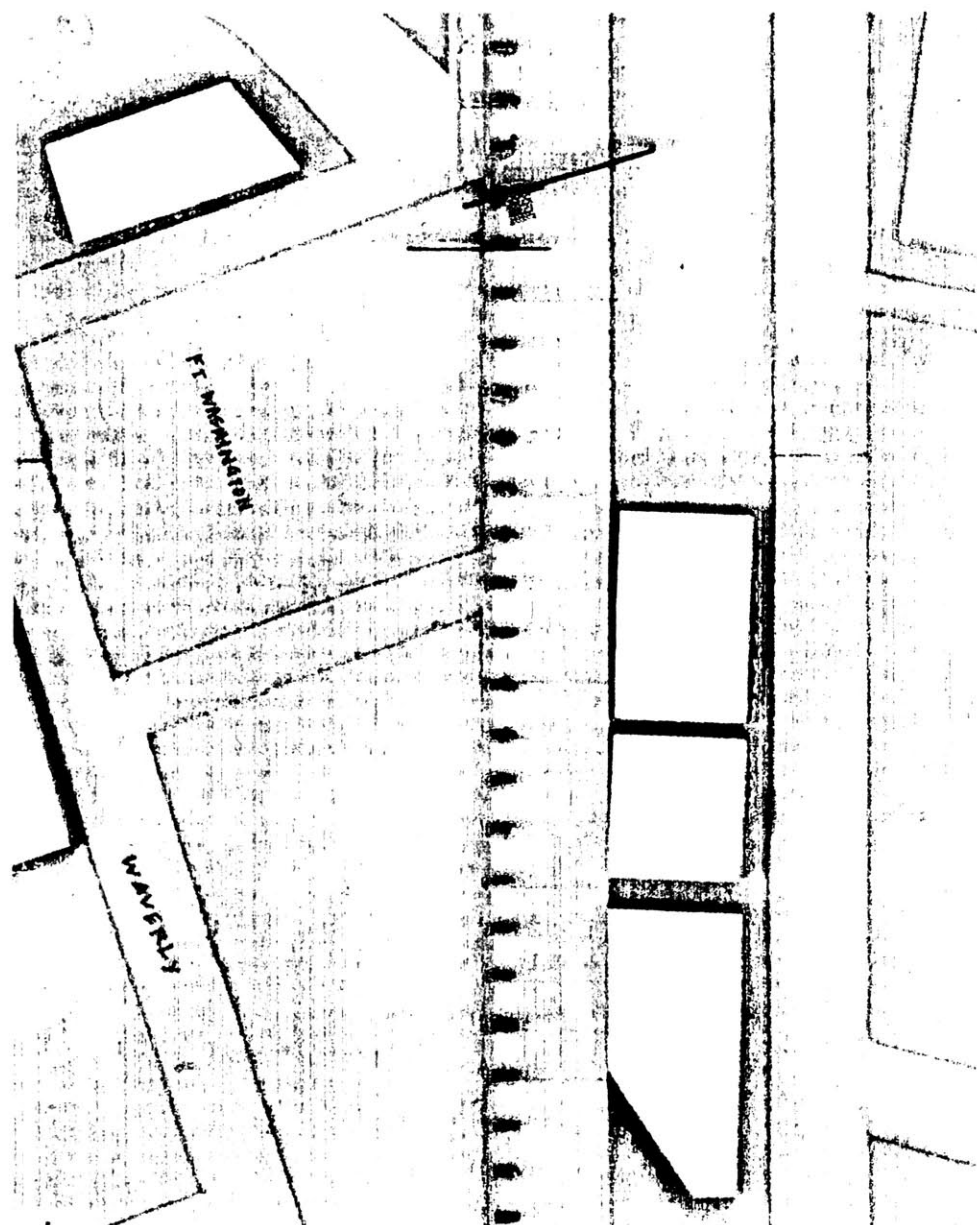


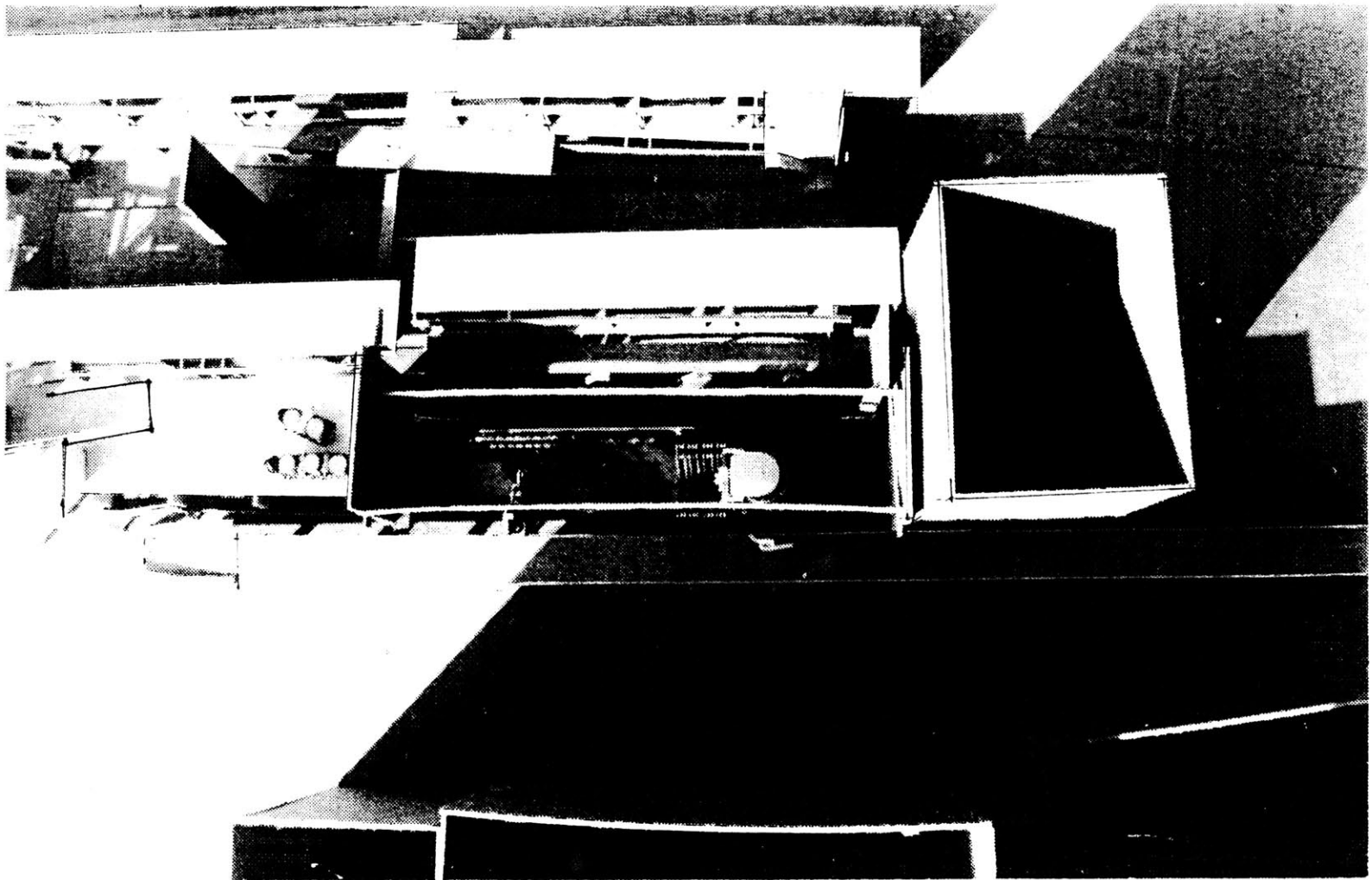
Model of site; Charles River to the right

4.1 Urban Path and Park: a vision for the city



4.1 Urban Path and park: a vision for the city



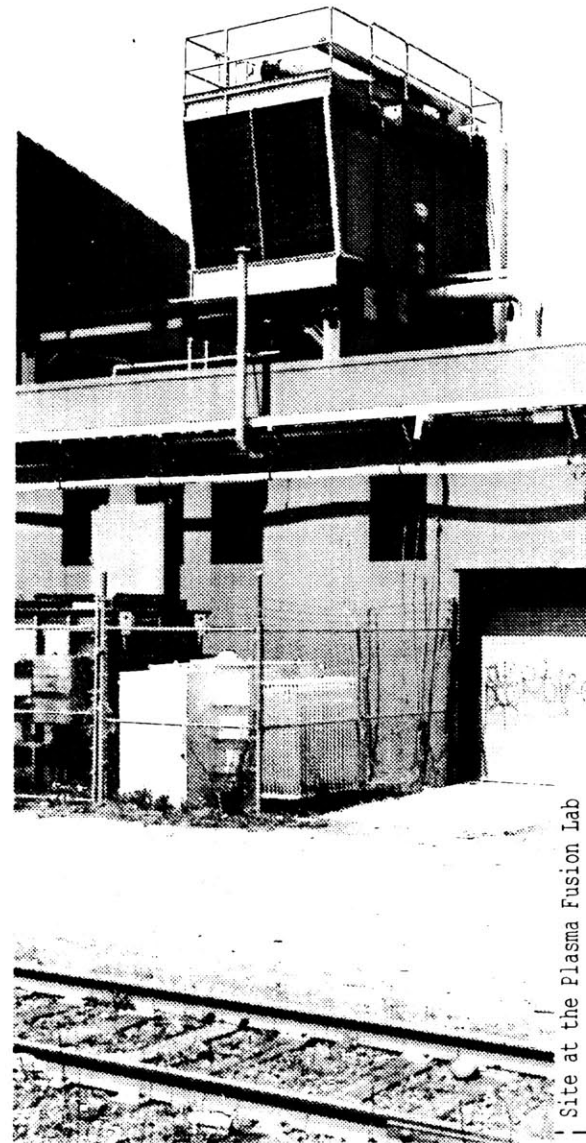


Proposed Labs; showing relationship to walkway. Note proximity of the large machinery to the public access.

#### 4.1 Urban path and park: a vision for the city

The transparent city is a public place. Functionally, it is an urban park, an alternate path of the Esplanade. A path that connects MIT to river and the river to MIT. It is not the most direct path because it moves through the technological parts of the campus and connects to some historical buildings. It is an educational place where people can learn about current technology as well as some history of the subject. The presentation will be such that it starts to challenge traditional ways of seeing the city. This path will also question the idea of museum. The city is the museum. An orientation center at the river and a museum for MIT at Massachusetts Avenue will be the intensifications of the whole site. From the technological labs, a direct dispersal of information is to be made. The framework which runs through the site provides large spaces for the labs to put their largest machinery, such that it is completely visible to the public. It is here that the framework insertion most greatly fosters the vision of transparency. The urban path runs through the frames at 12 feet above the ground. The path, at points, contains a series of billboards intended for artists to make public works, which will change every year. The opening of the work coincides with the Head of the Charles weekend.

The park is just over one half the length of the site. It is a reclamation of the track zone through a minimal intervention. The planting of trees, and a skeletal path framework comprise the largest work. A pair of lookout towers will be constructed as a kind of city watching mechanism. The skeletal framework will be a



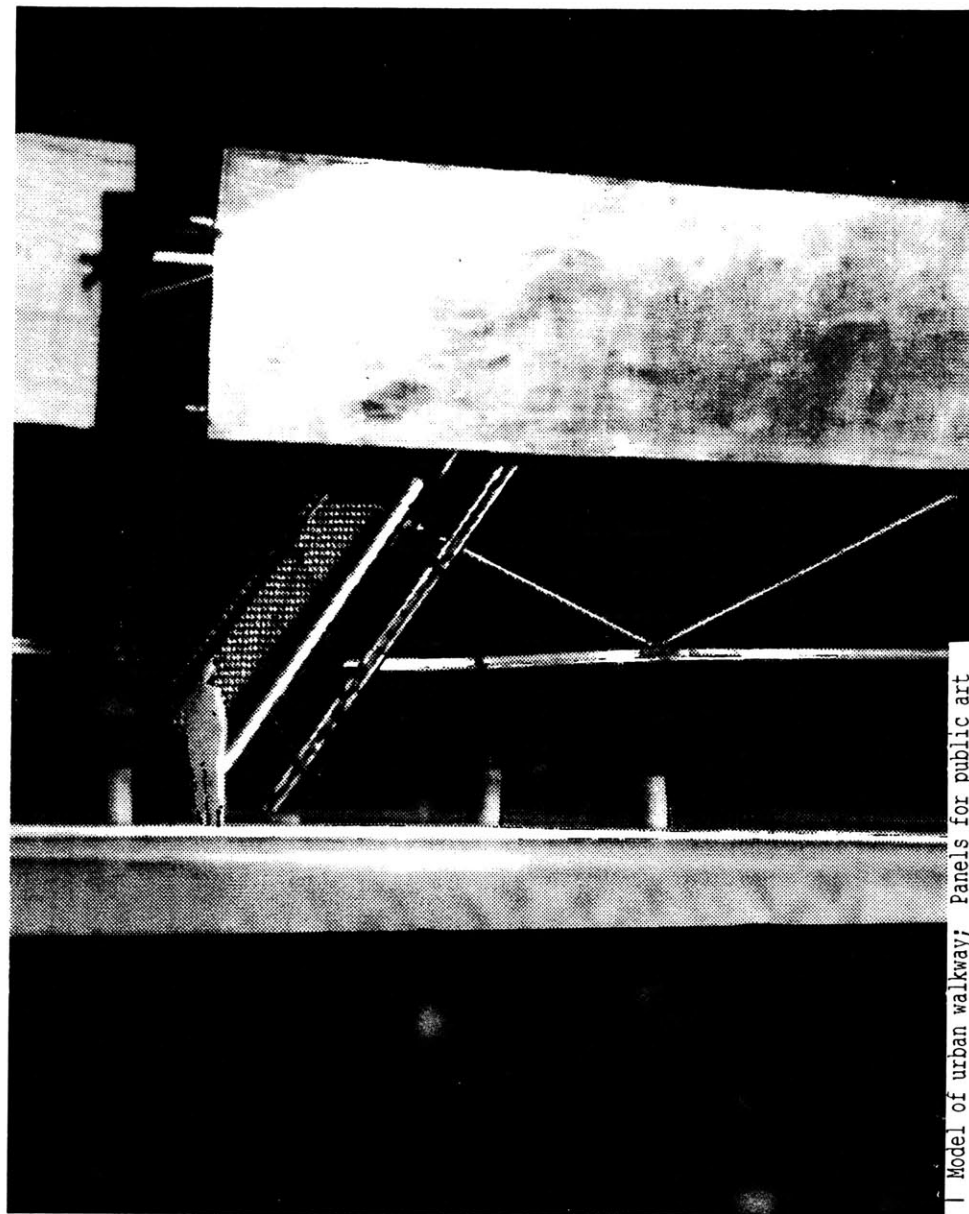


| Site looking to the river



| Conceptual sketches; Relationship of train to the public

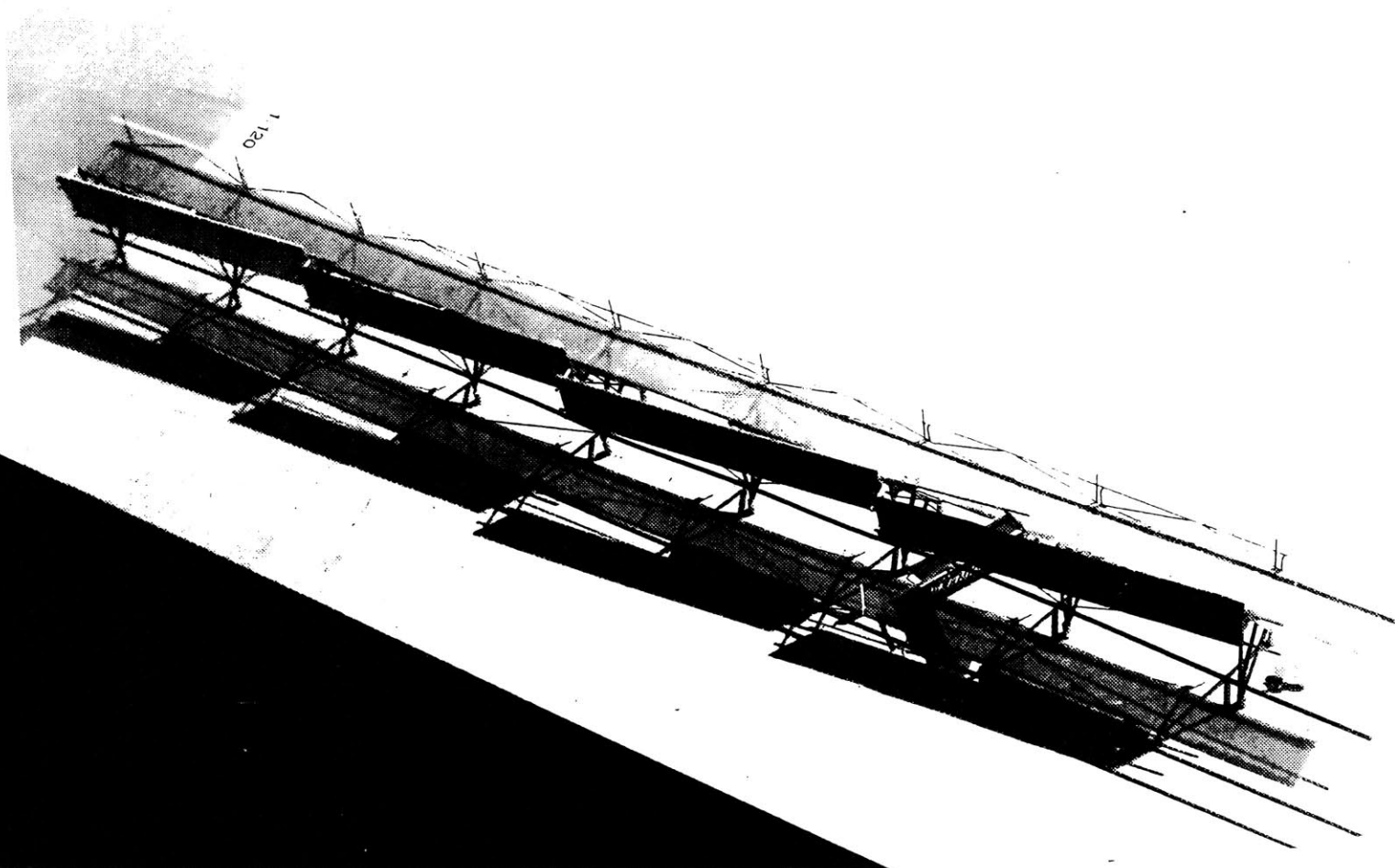
continuation of the urban path and is made of the structure repeated at intervals of 25 feet. Again, the reason is to mark the path.

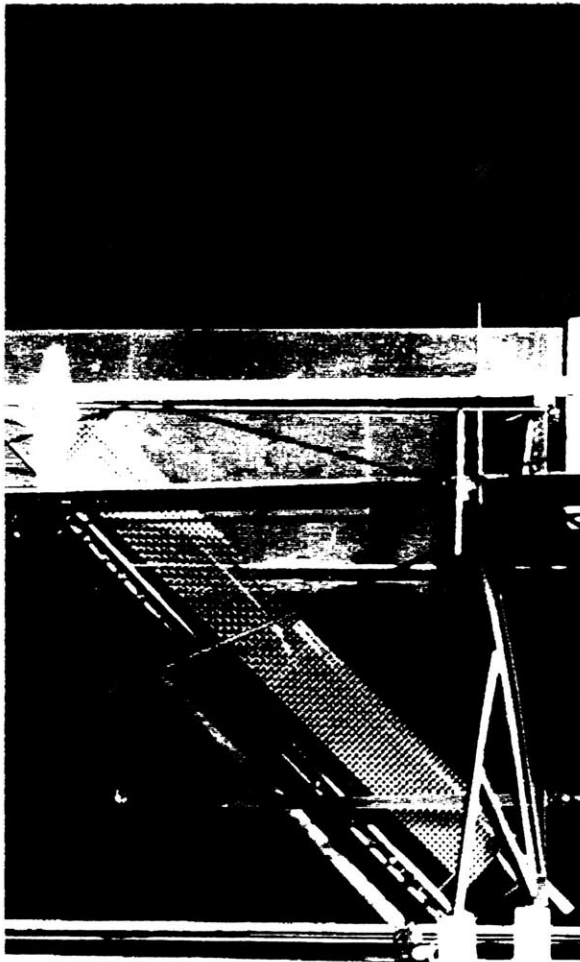


| Model of urban walkway; Panels for public art

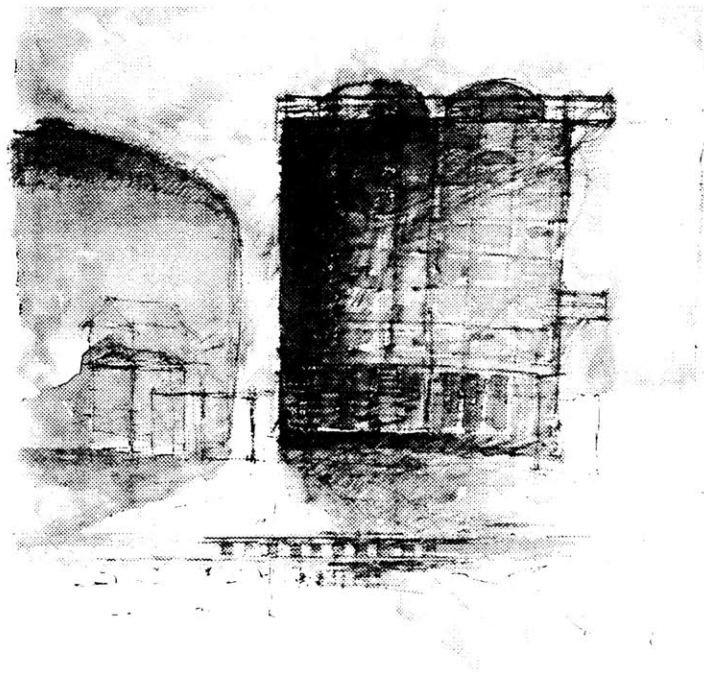


Model of urban walkway: Panels toward the rails





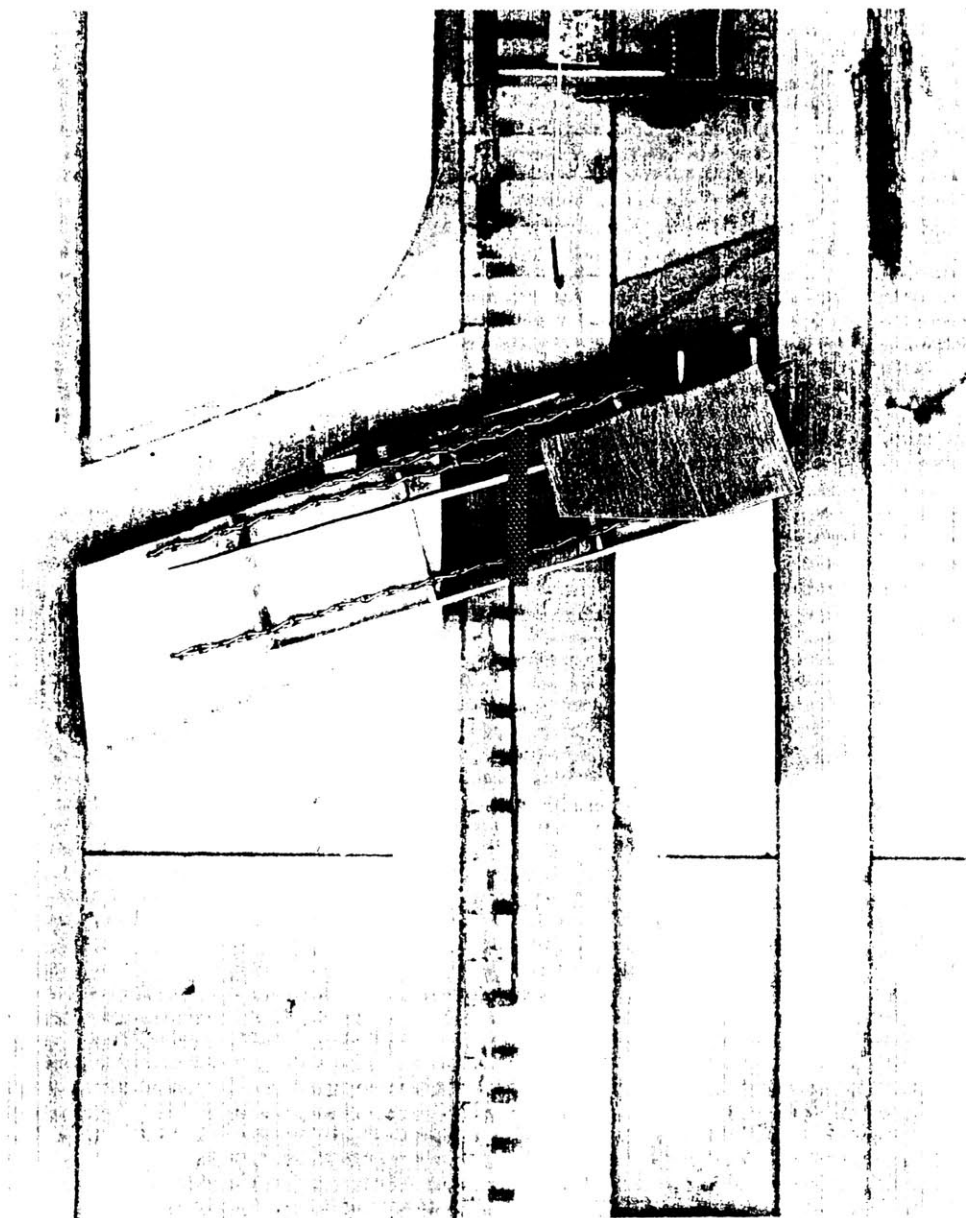
| Model of urban walkway; Detail of stair.

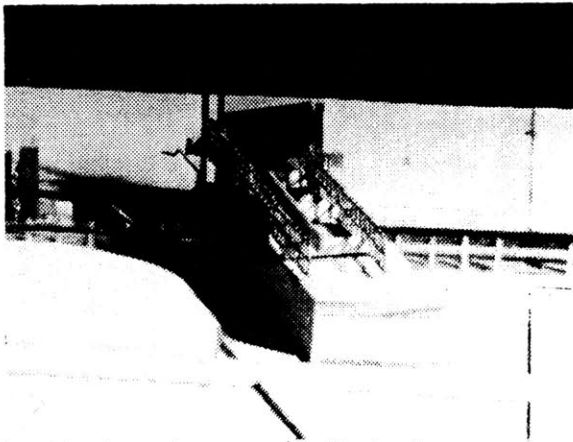


| Site at the fission reactor and cooling tower; watercolor

4.2 Connections to the fabric

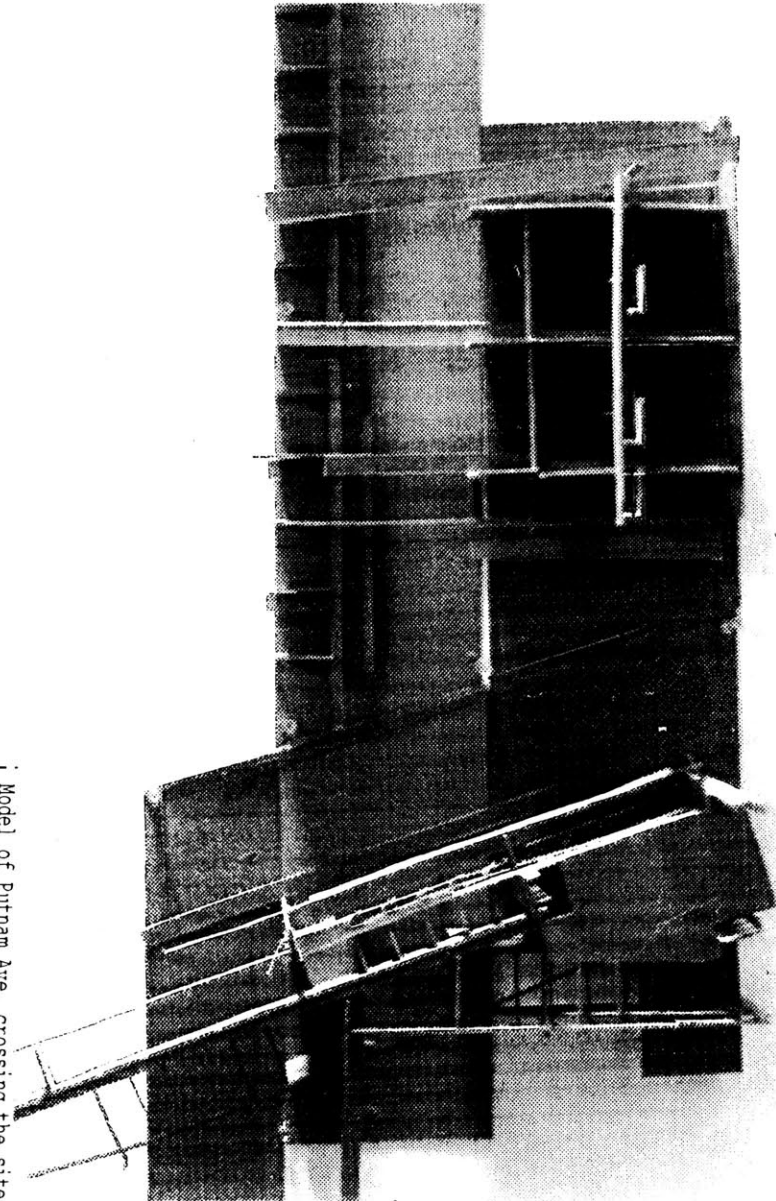






| Model of structure crossing the tracks

| Model of Putnam Ave. crossing the site



## 4.2 Connections to the fabric

### *Street extensions*

The extensions Putnam Avenue and Pacific Street will bring traffic across the tracks. By moving across the tracks in cars and on foot, people will start to add the site and its functions to their mental map of the city. It is important that automobiles cross the site because one feels safer driving than walking, and they are more likely to try a new route in their cars than on foot. The reason this exploration is necessary if people of the city are to use the project as a public place.

The street extensions also divide the site into parts. This works to subtly break the project into three pieces, each on the scale of a long city block or two. This demarcation is a way to relate the passage through the site to existing urban experiences.

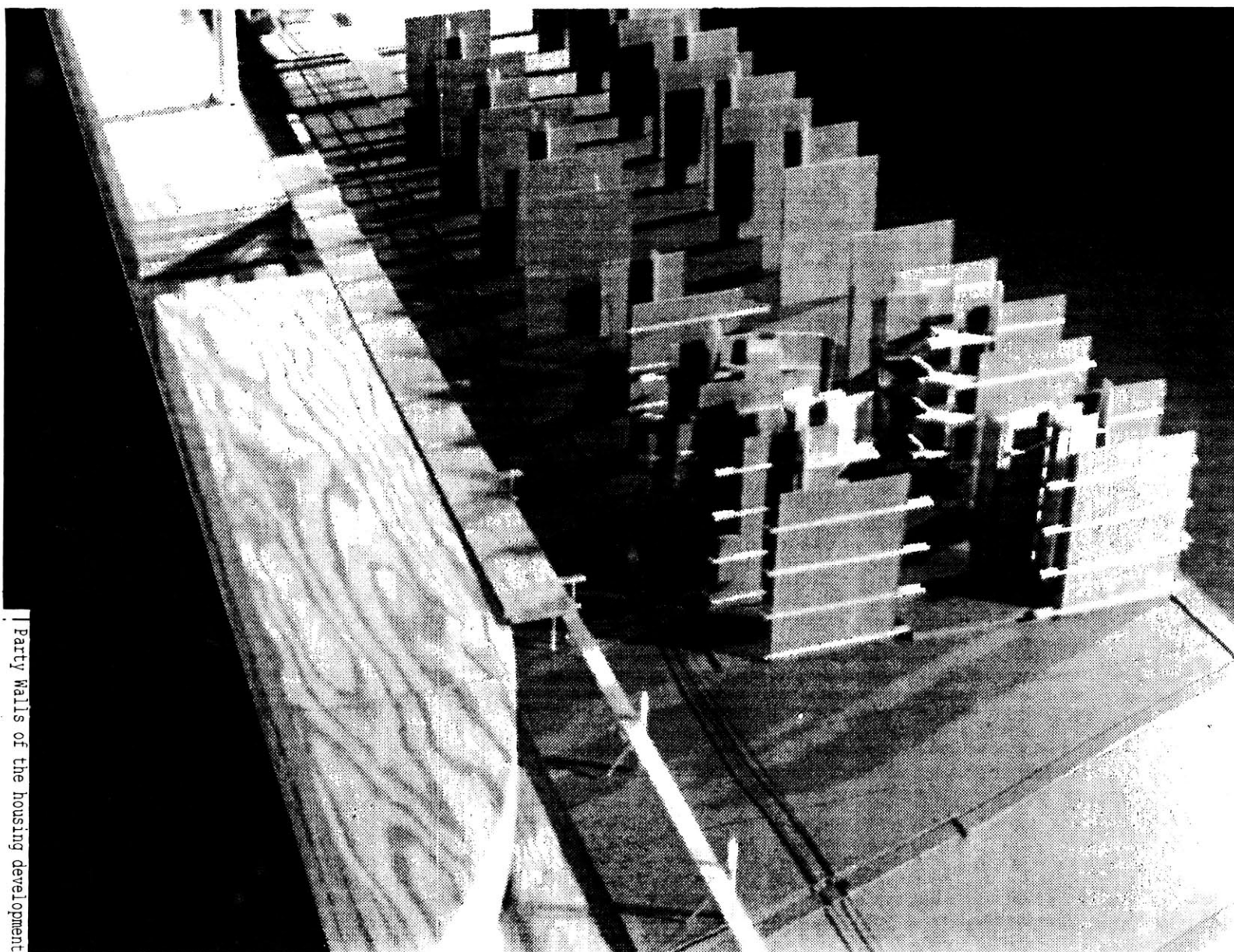
The next level of connection is public use. Institutions along the site provide stable reasons for use by the community, and in conjunction with other smaller scale public uses, like restaurants and shops, provide a more comprehensive public experience. The institutions are placed where they are accessible, at street intersections, the river edge, etc., yet are spaced such that they provide intensifications of activity along the site.

### *Context*

Another way of connecting to the public realm is through the building of housing and laboratories in the zones adjacent to the track. This is an intermediary between the existing context and the project on the tracks. Because of the



Elevated path crossing Putnam Ave.



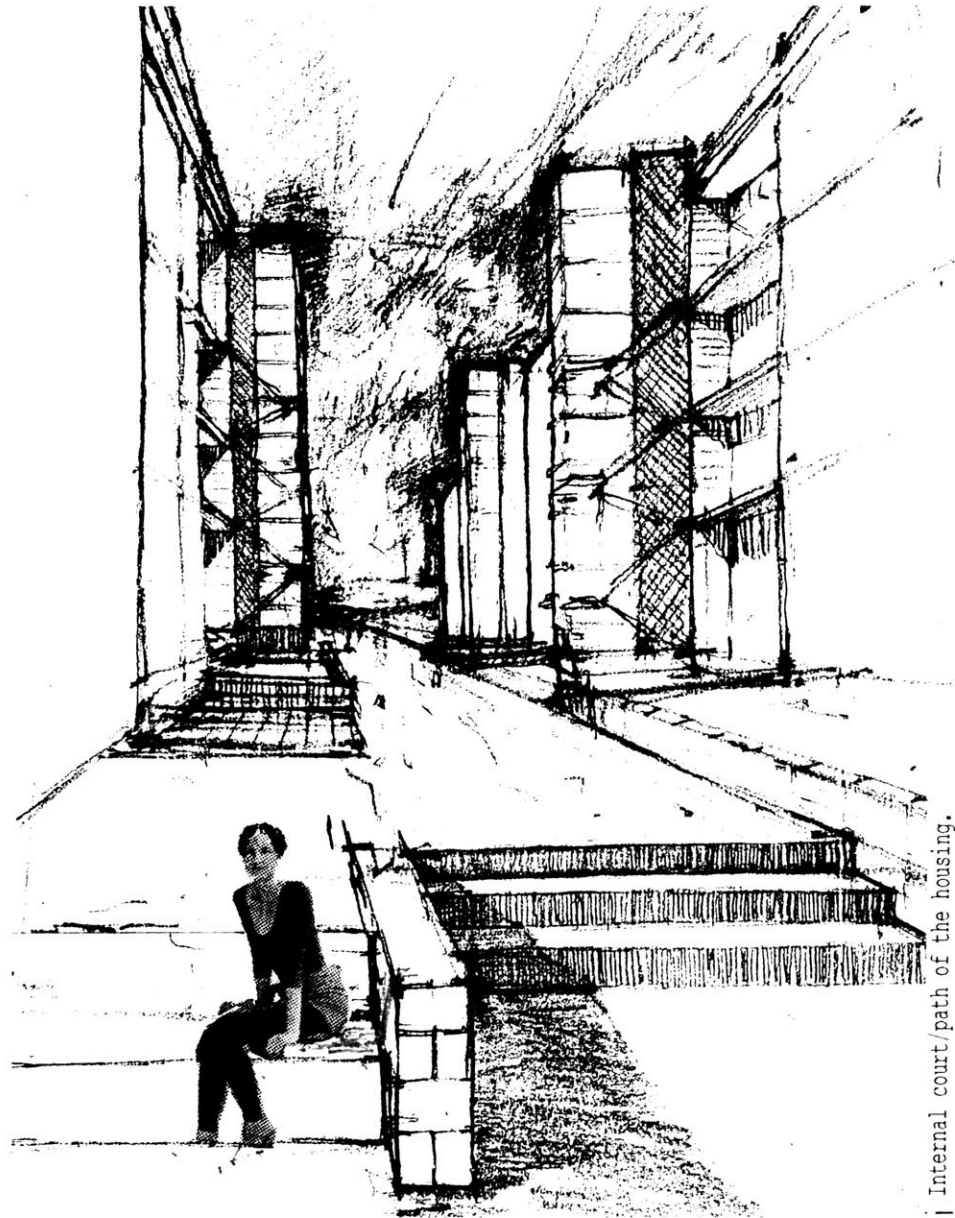
Party Walls of the housing development



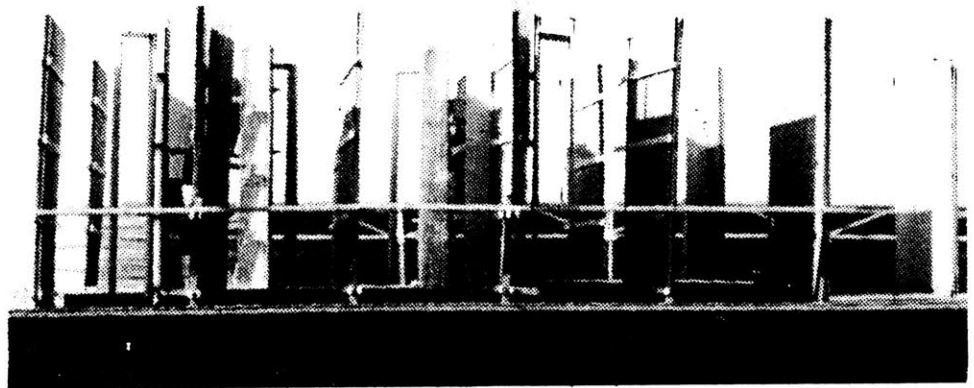
positive way it addresses the new public space, it is a model for other buildings in this zone.

The way the housing and the laboratories are constructed works with both the notion of the framework and with the notion of infrastructure. They provide the opportunity for the permanent characteristic of the infrastructure to be used in a way that is inhabitable. The infrastructure becomes party walls. These walls also hold the concrete walkway, which is supported at other points by smaller walls.

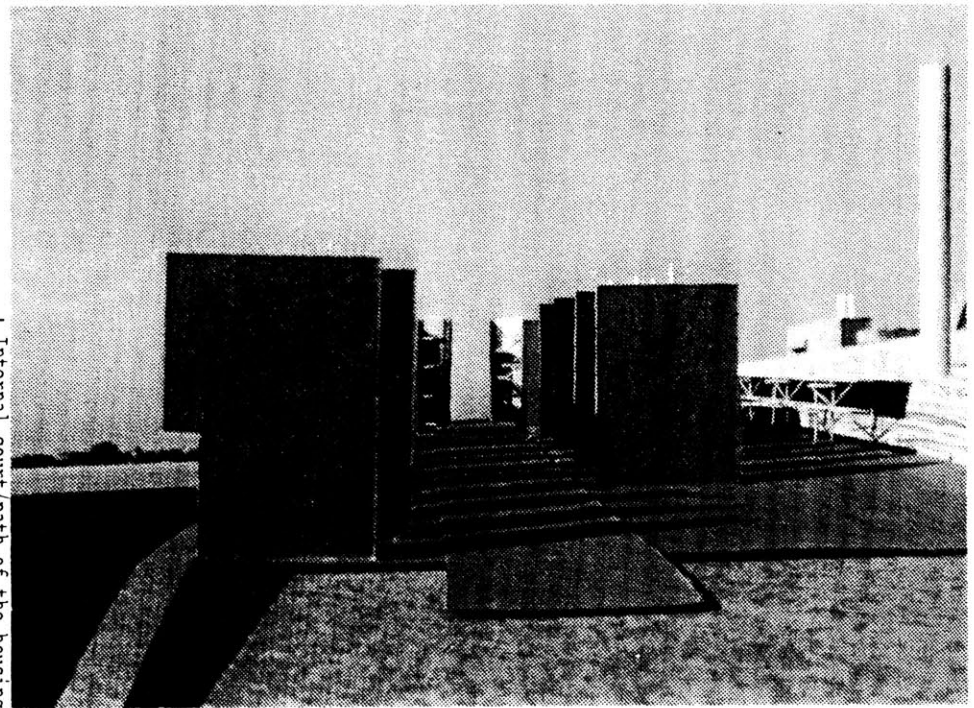
The housing and labs are investments in the site that add stable program elements and physical form both of which reinforce its public nature.



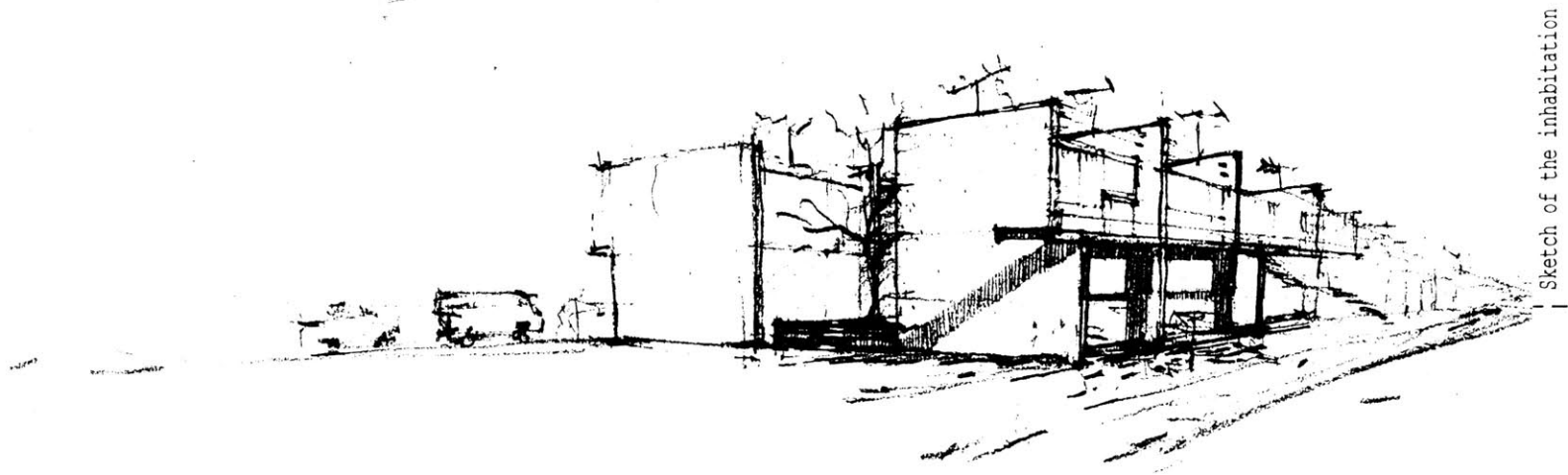
| Internal court/path of the housing.



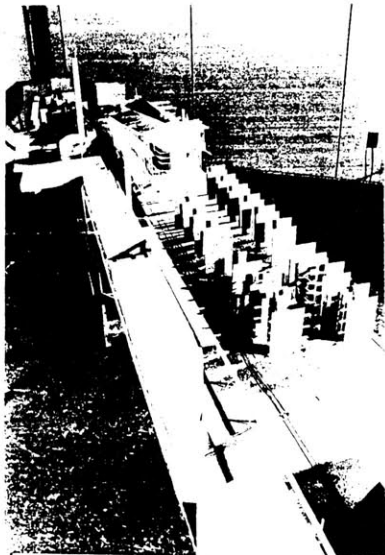
| Party Walls of the housing development.



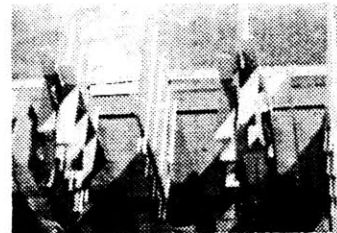
| Internal court/path of the housing



Sketch of the inhabitation



Housing in relationship to the site

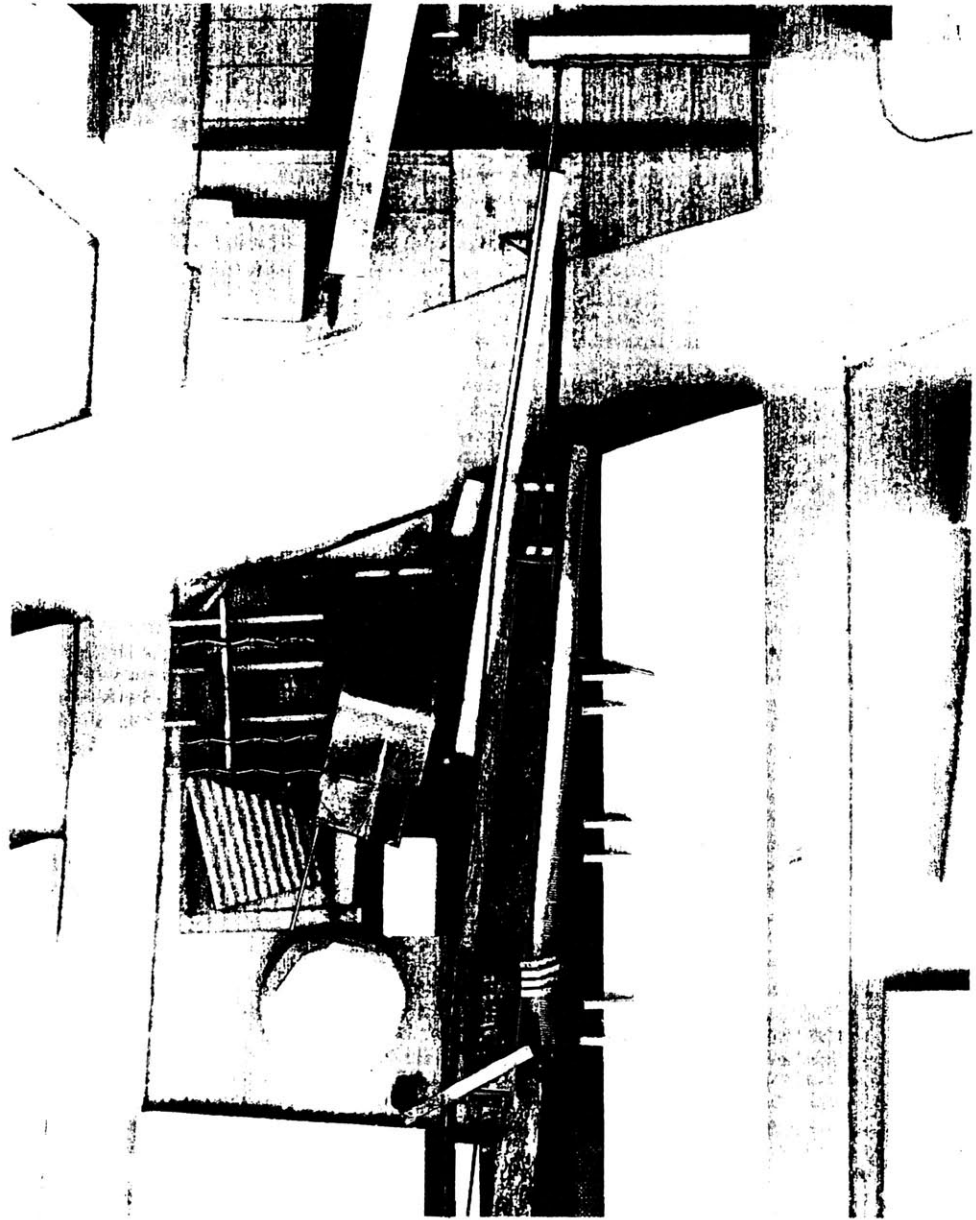


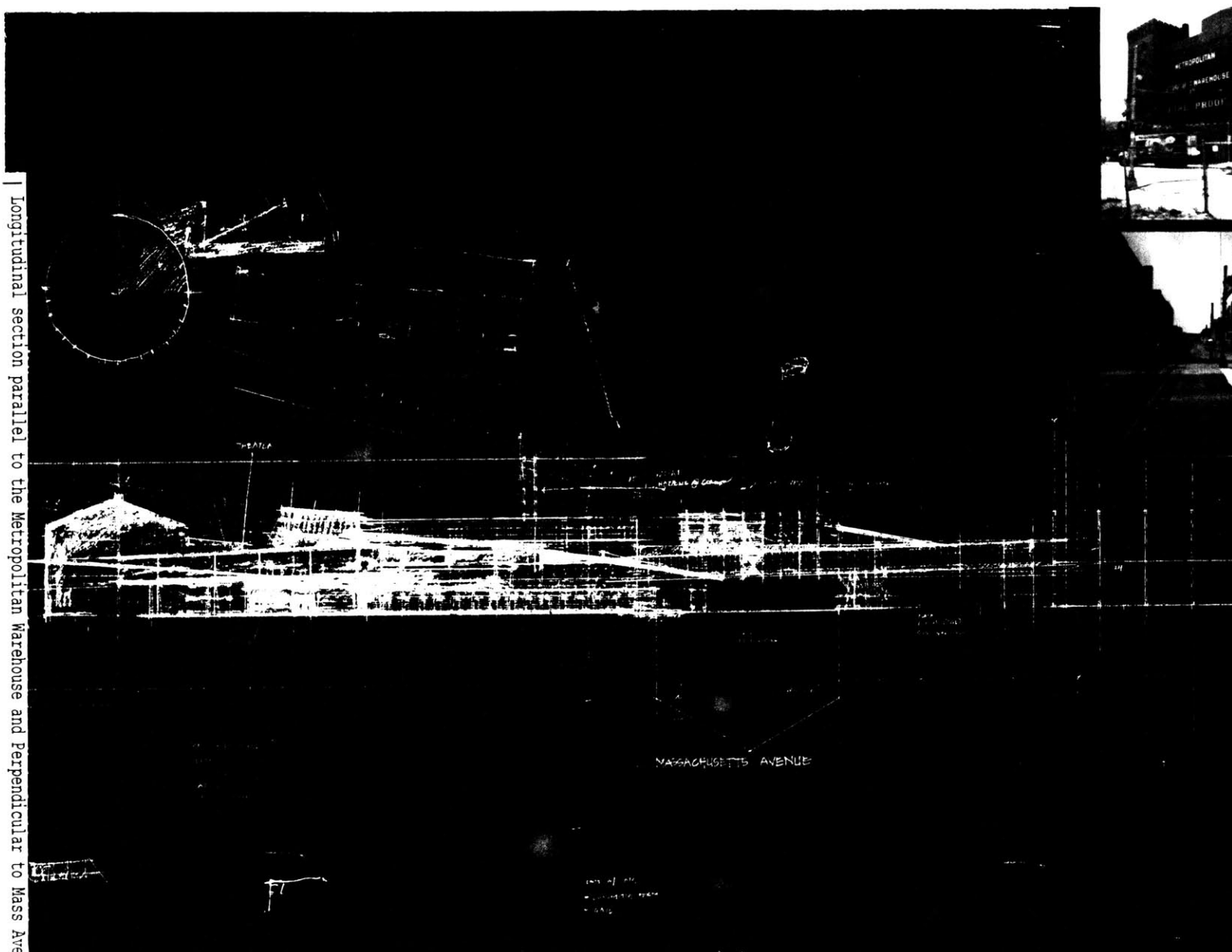
Detail

! 4.3 Anchor 1

Anchor 1

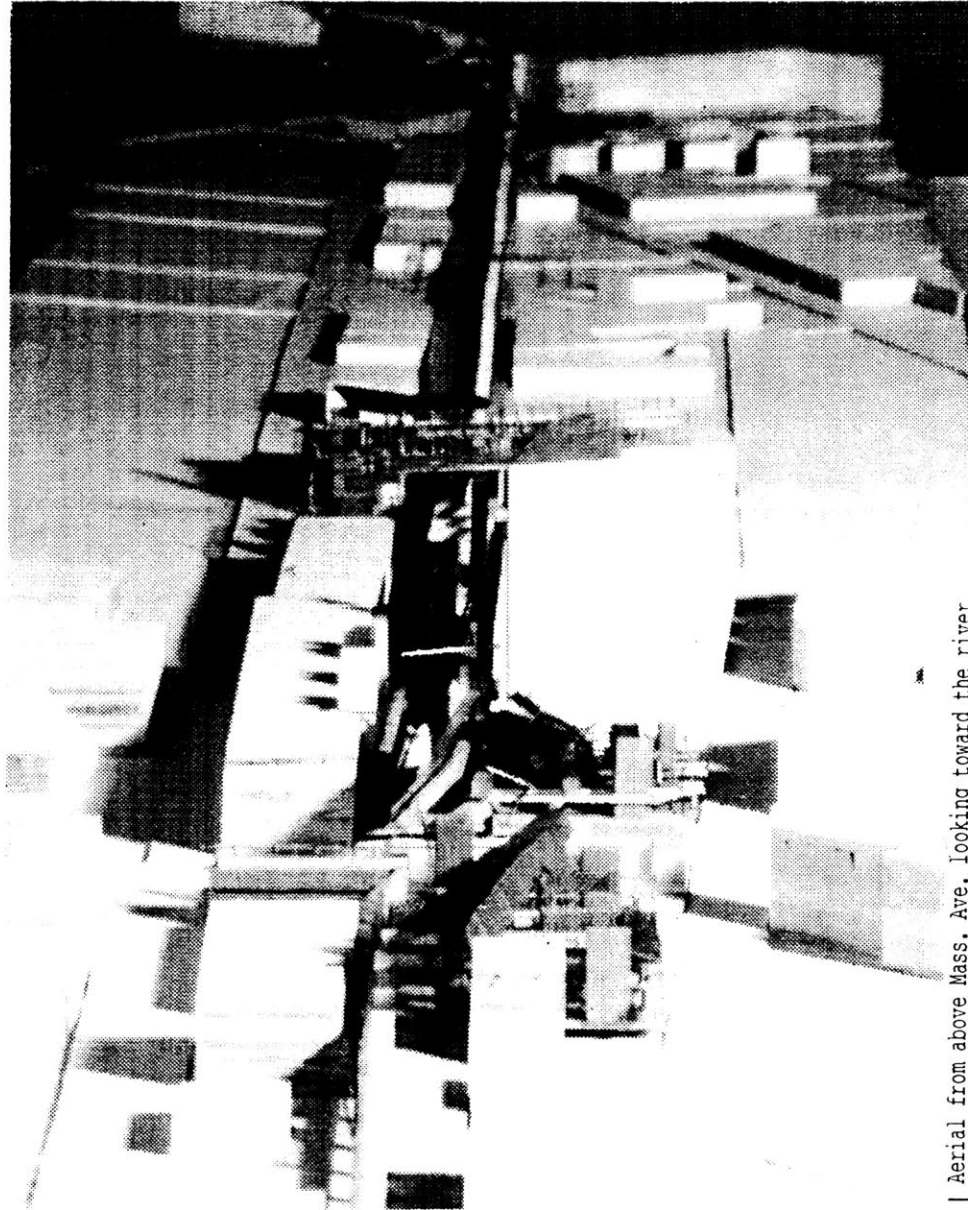






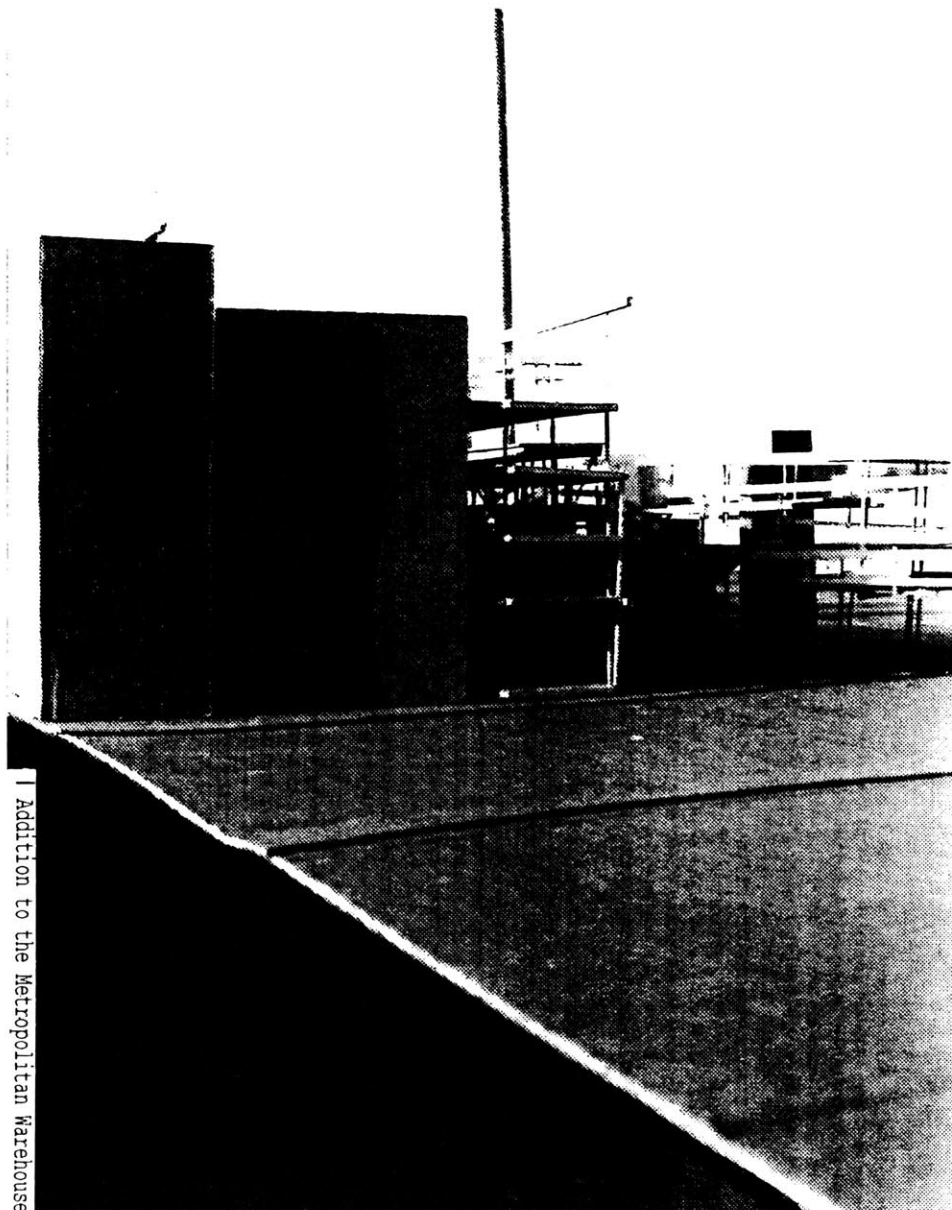
#### *Anchor 1*

The intersection of Massachusetts Avenue and the railroad is the first urban anchor of the project. More people walk, drive, or bike by this part of the site than any other part. It is also closest to MIT's activity centers. Because of the existing patterns of pedestrian traffic and its closeness to MIT, it is logical that this end of the site contains the greatest intensity of functions, particularly those most commonly public, shopping and eating places. The attempt is to build an alternative public space that would support functions better suited to the fringe of the campus. An increase of activity at this point establishes a strong tie between the site and the existing fabric. With the connection made by the programmatic elements, the physical forms of the site can work to emphasize the direction of the site and orient to the river at the B.U. bridge.



| Aerial from above Mass. Ave. looking toward the river



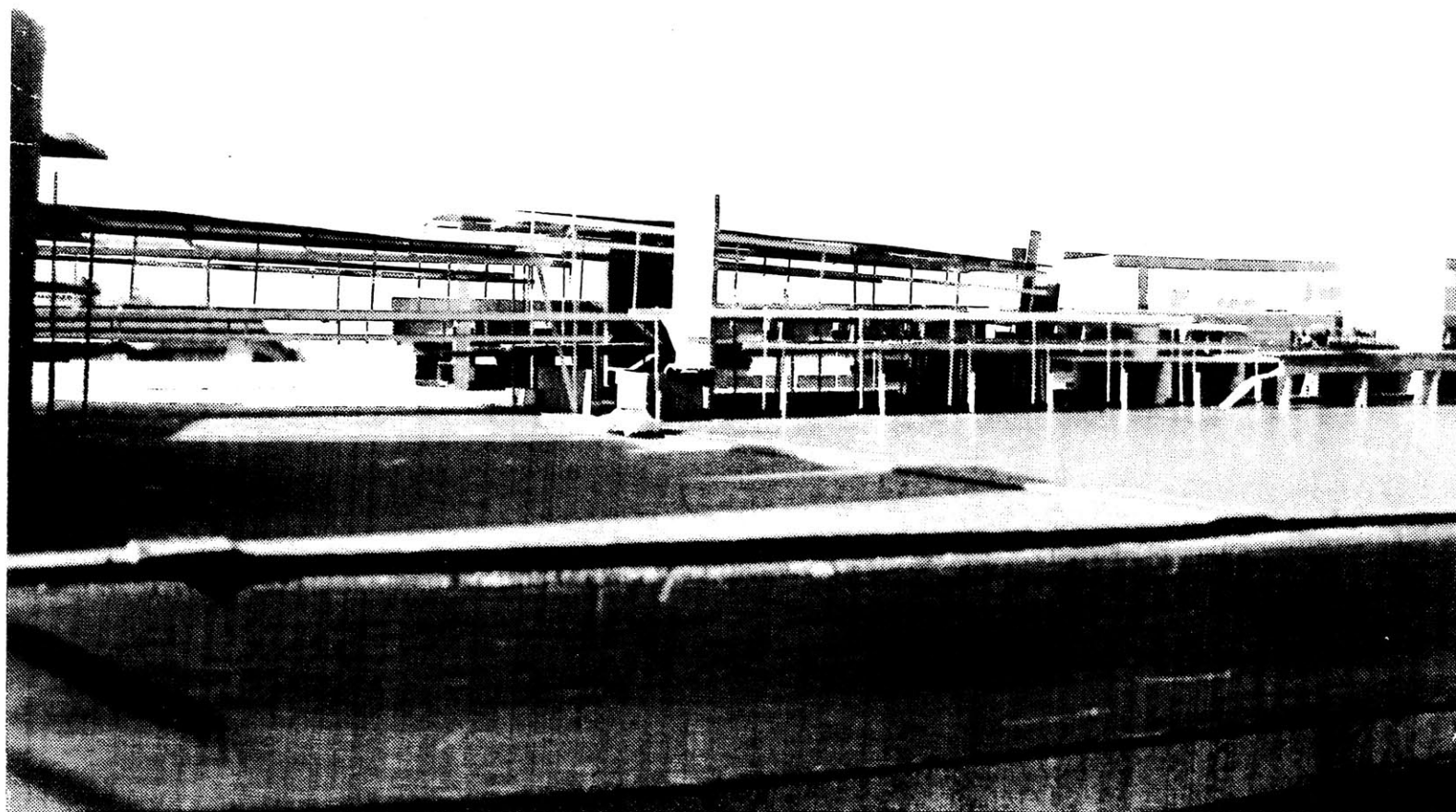


Addition to the Metropolitan Warehouse

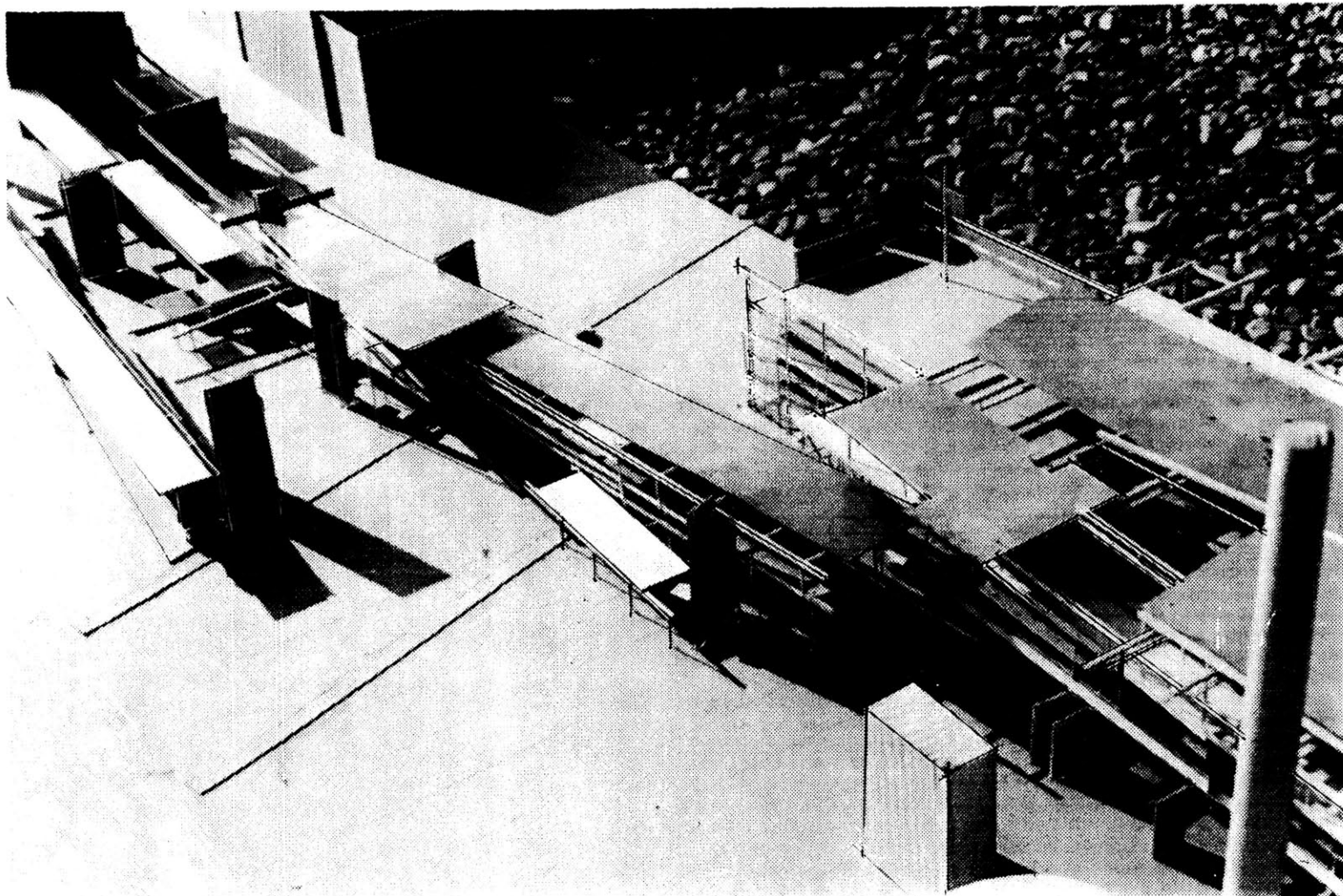


The program includes

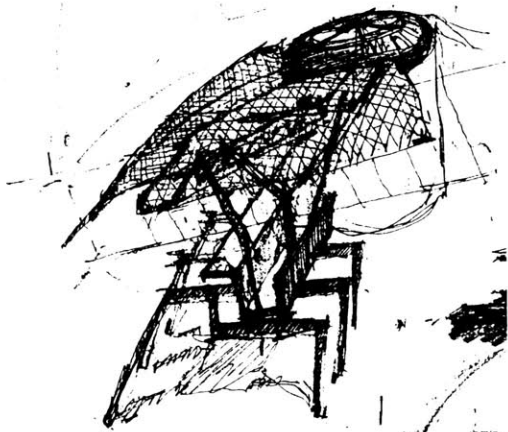
- A museum for MIT  
to house the scientific archives and the existing functions of the museum (currently at 265 Massachusetts Ave.)
- Laboratories  
particularly a new building for the High Voltage Research Lab.
- Shopping and restaurants  
a double level of shops to increase the density of the site.
- Classroom Building for the Institute  
A Renovation of the Metropolitan Warehouse in conjunction with the construction of a narrower building next to it.



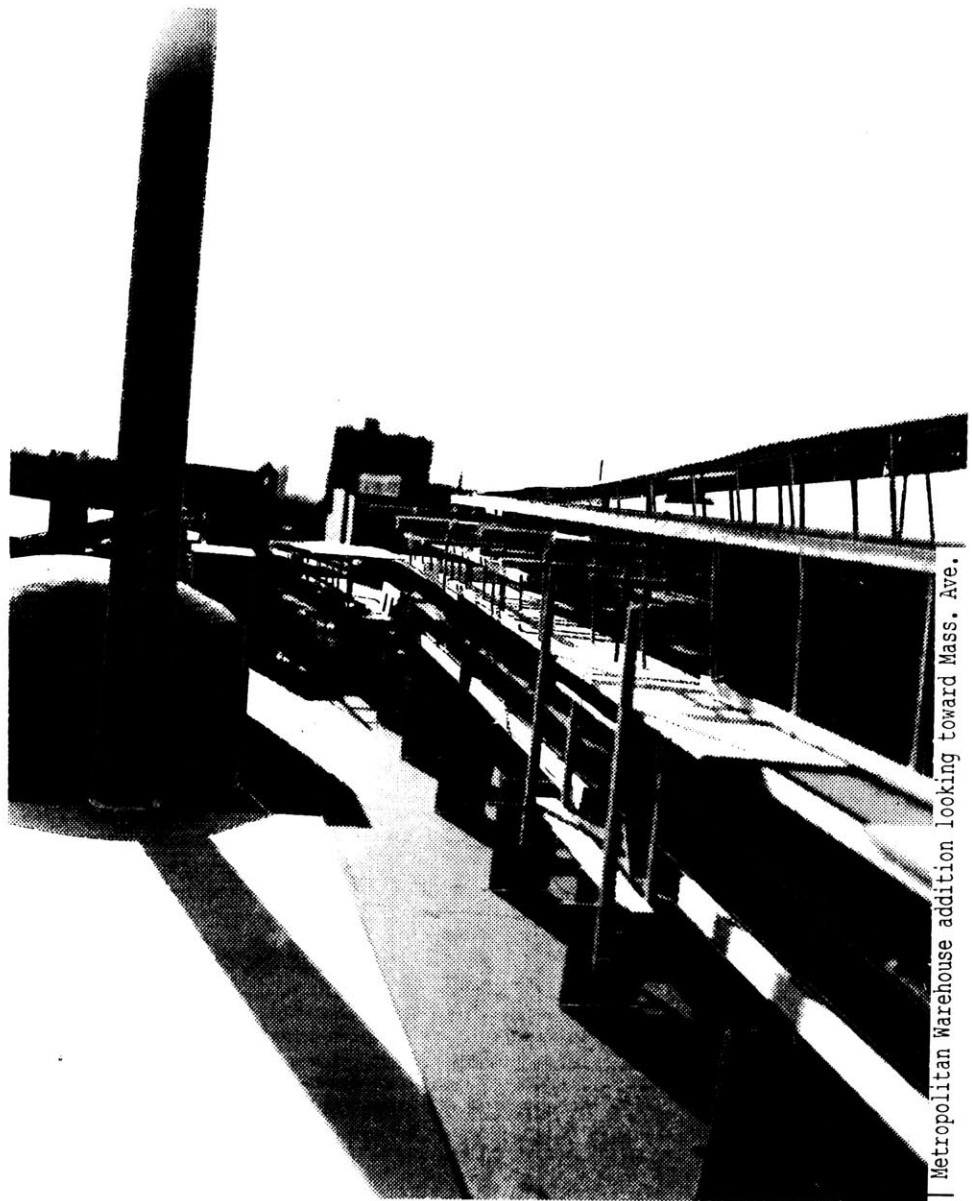
Elevation of MIT museum crossing Mass. Ave and connecting to the Metropolitan Warehouse



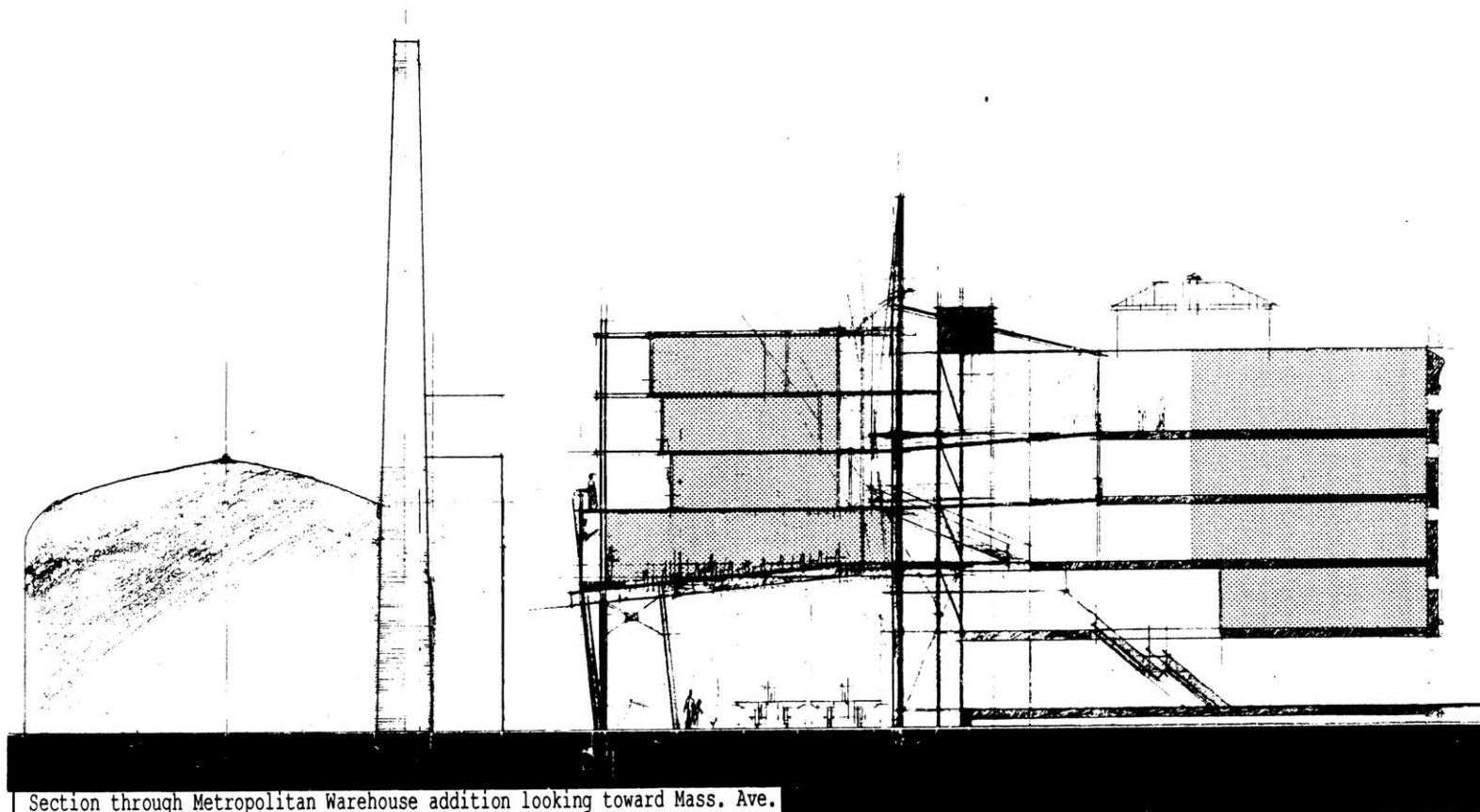
| Aerial of the MIT museum crossing Mass.Ave.  
| The Fission Reactor is in the lower right



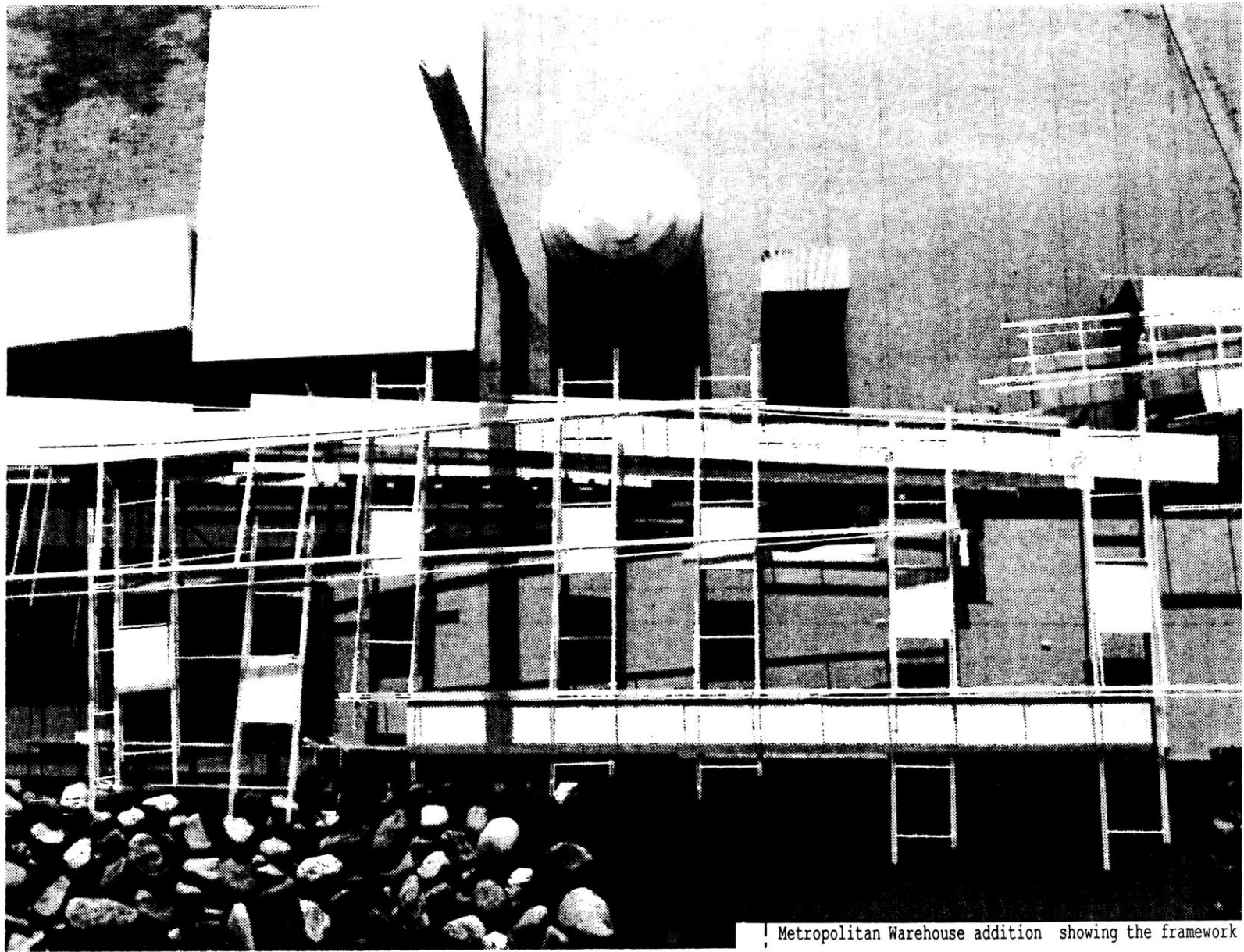
| Conceptual sketch of a structure over the tracks



| Metropolitan Warehouse addition looking toward Mass. Ave.

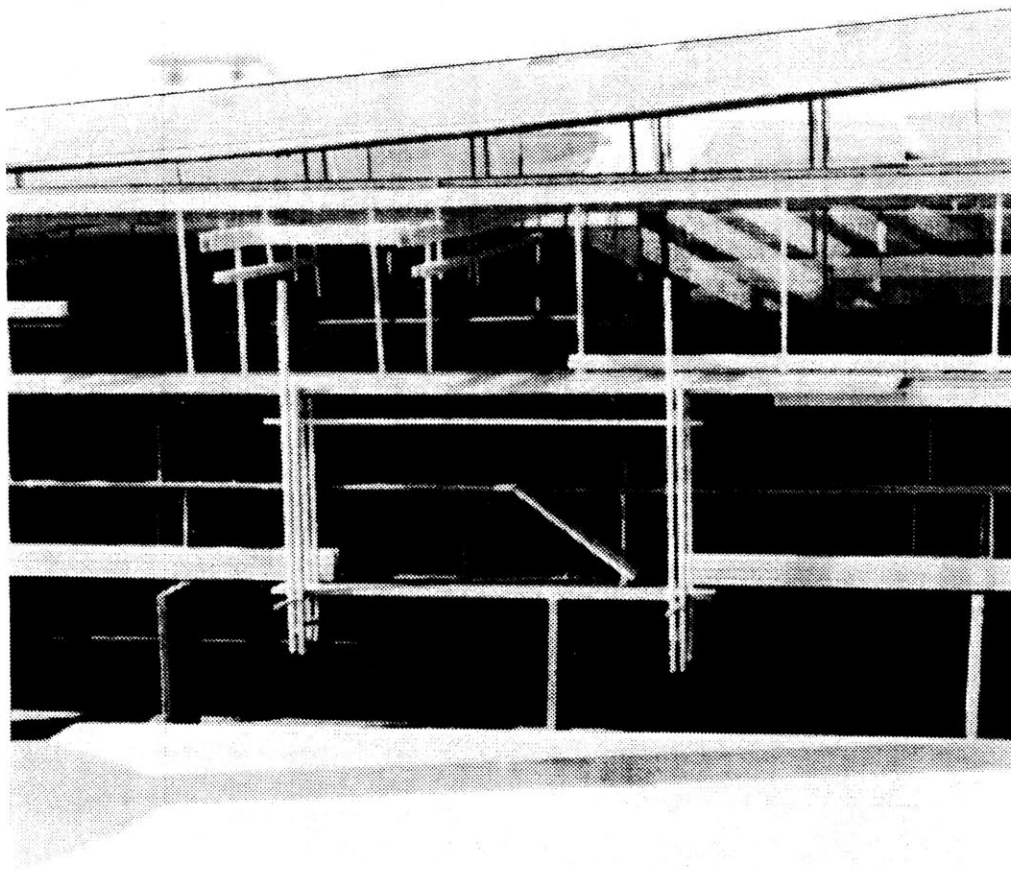


Section through Metropolitan Warehouse addition looking toward Mass. Ave.



Metropolitan Warehouse addition showing the framework





| Detail of the Metropolitan Warehouse addition

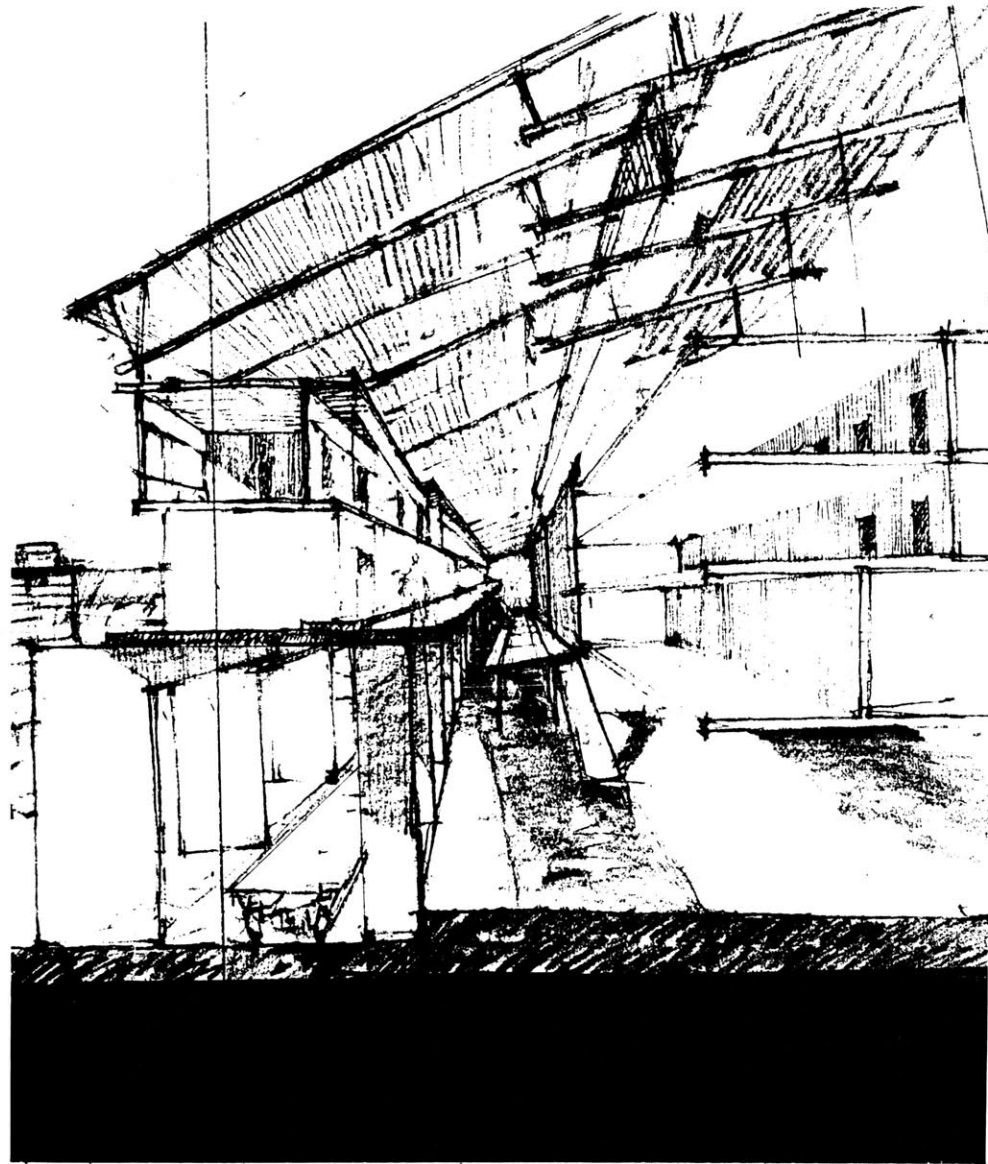


| Site photo

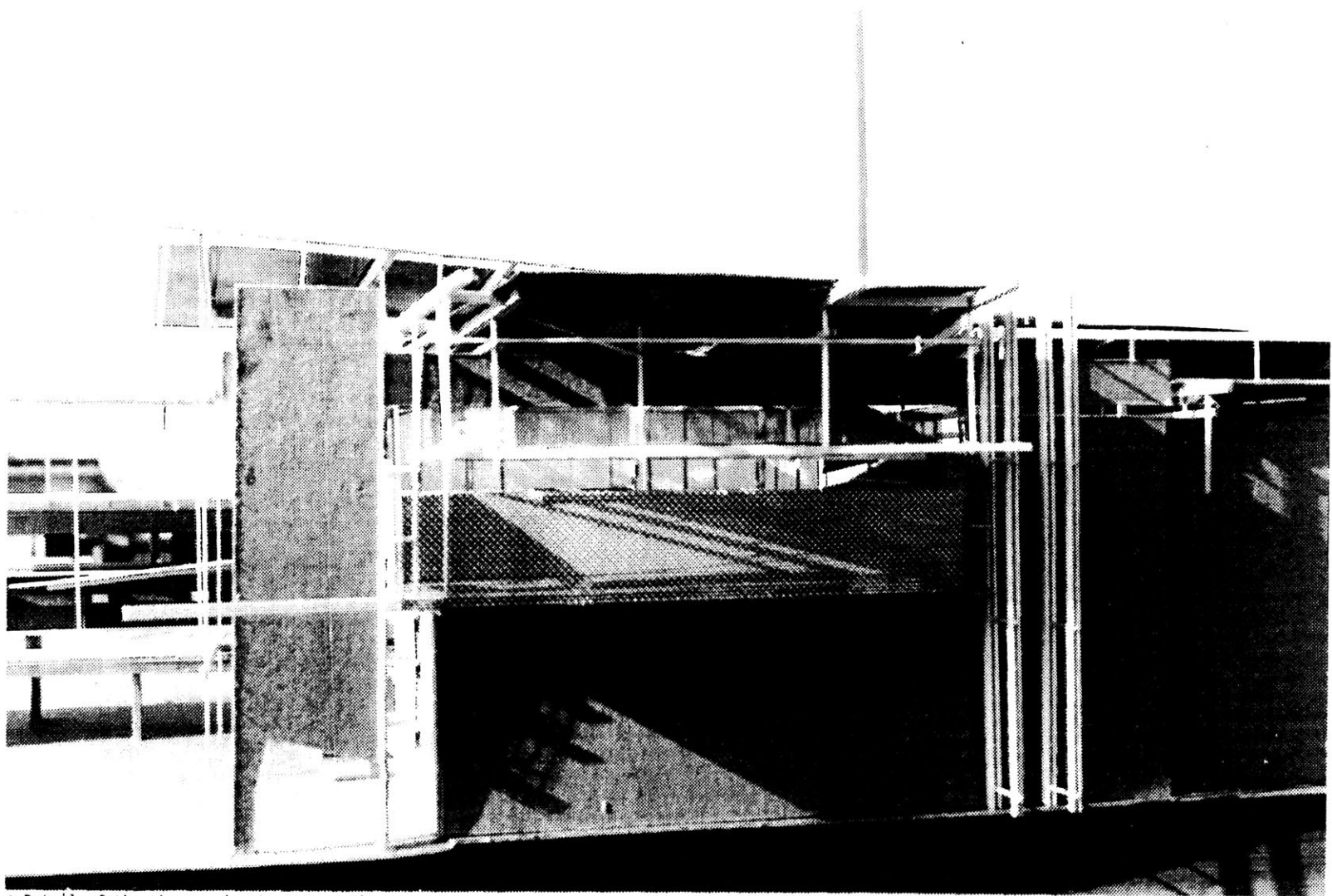




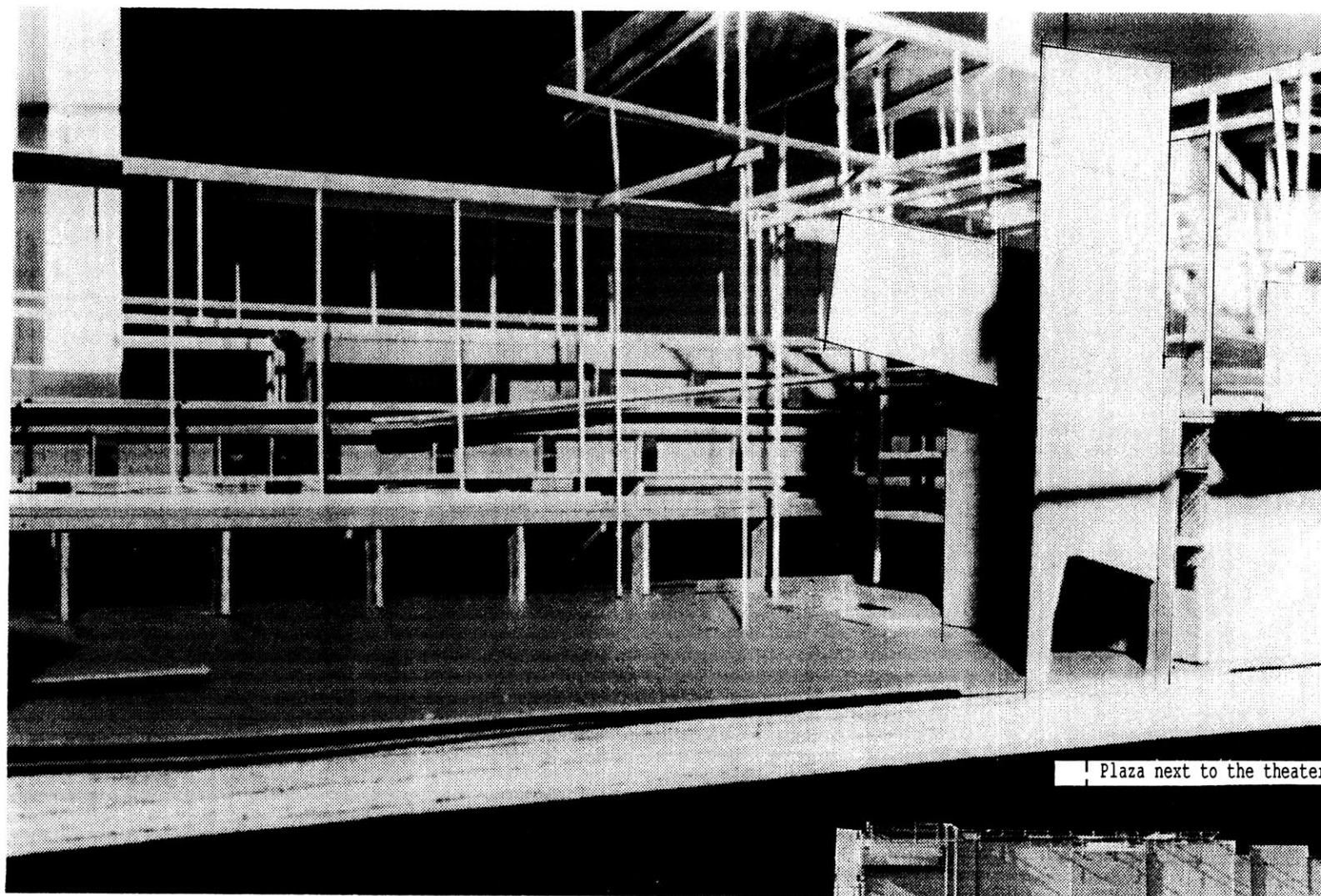
| Site photo



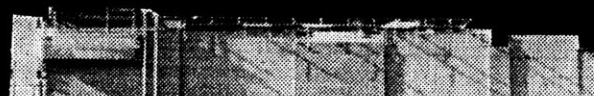
| Sectional perspective through Metropolitan Warehouse addition looking toward Mass. Ave.



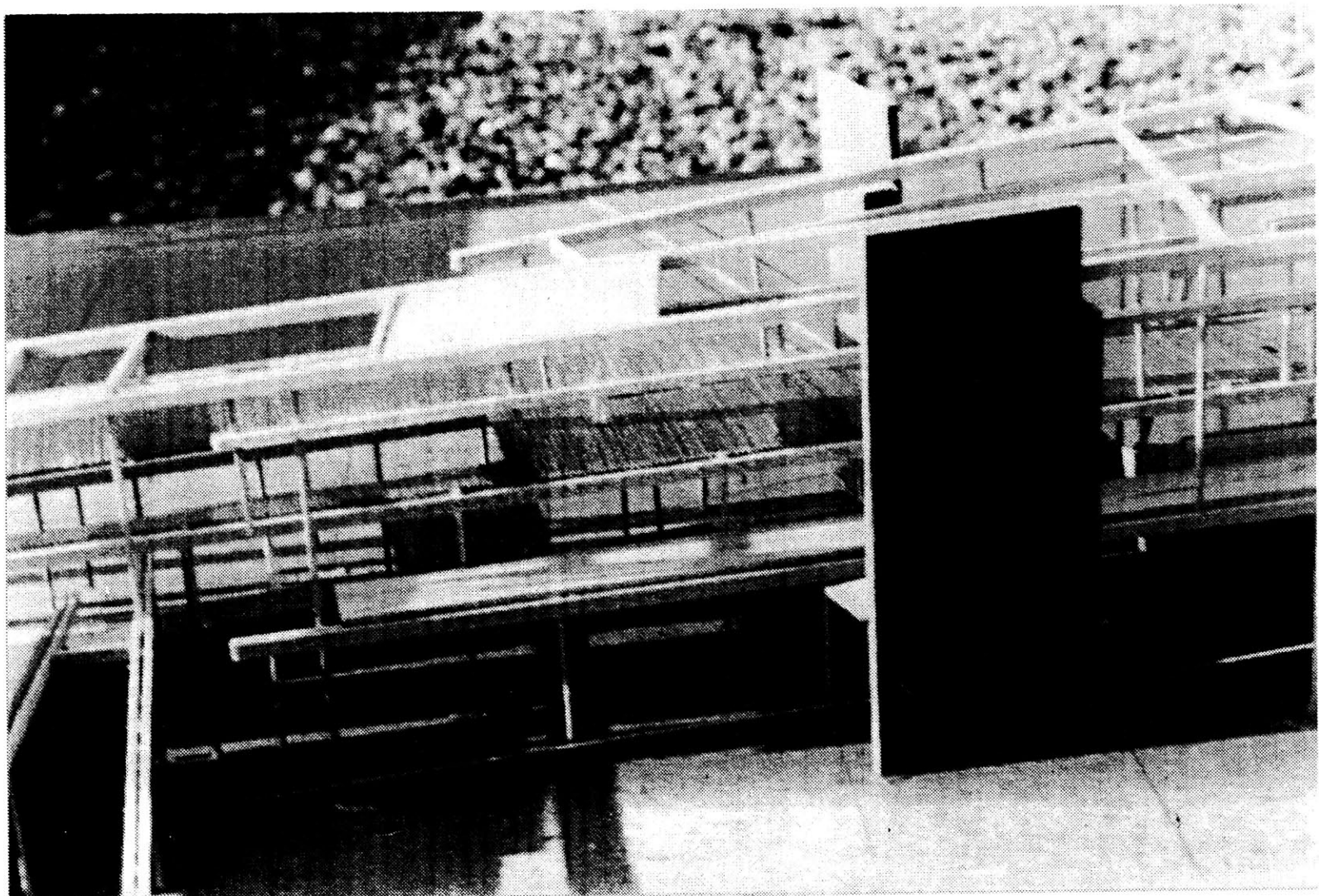
| Detail of the theater in the Metropolitan Warehouse



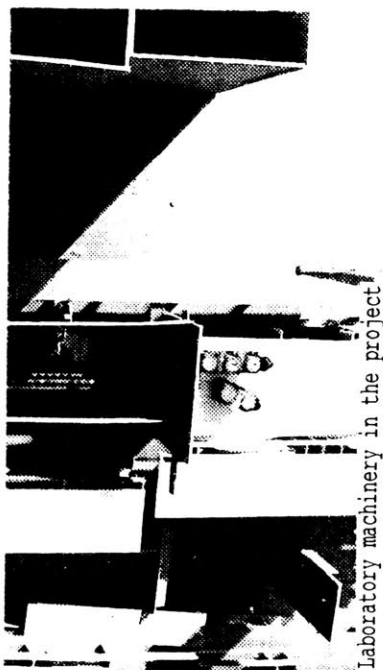
Plaza next to the theater



Metropolitan Warehouse addition



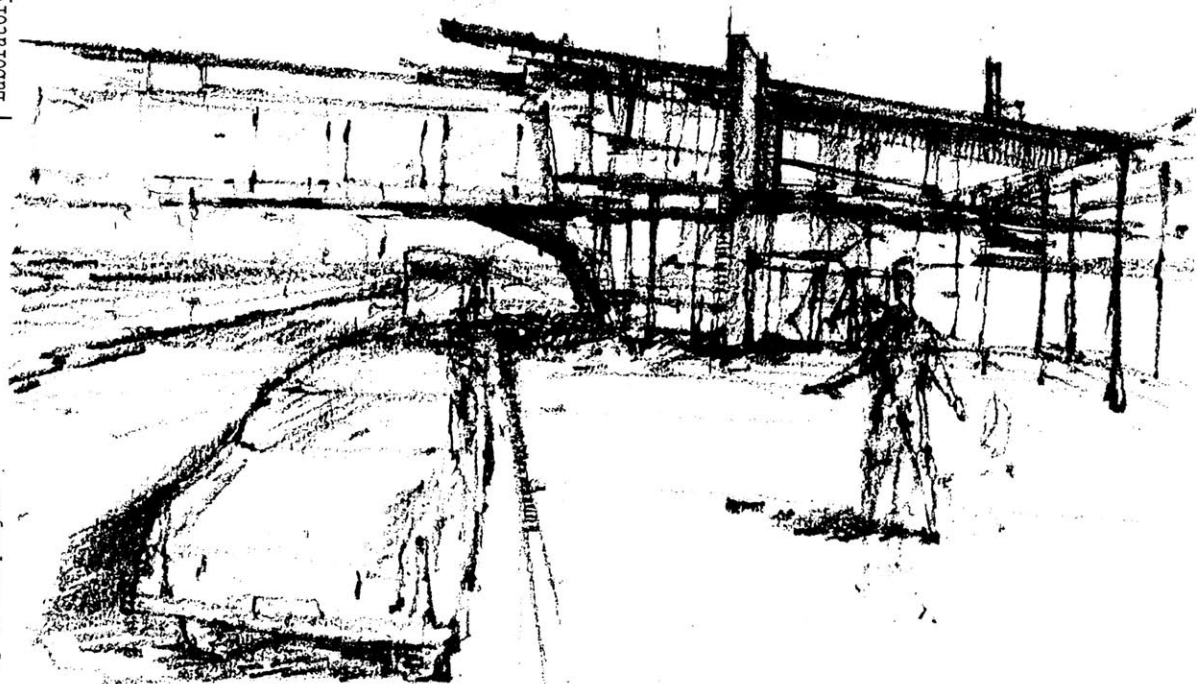
1 Detail of the MIT Museum; showing the relationship between the concrete stair towers and the frames



| Laboratory machinery in the project

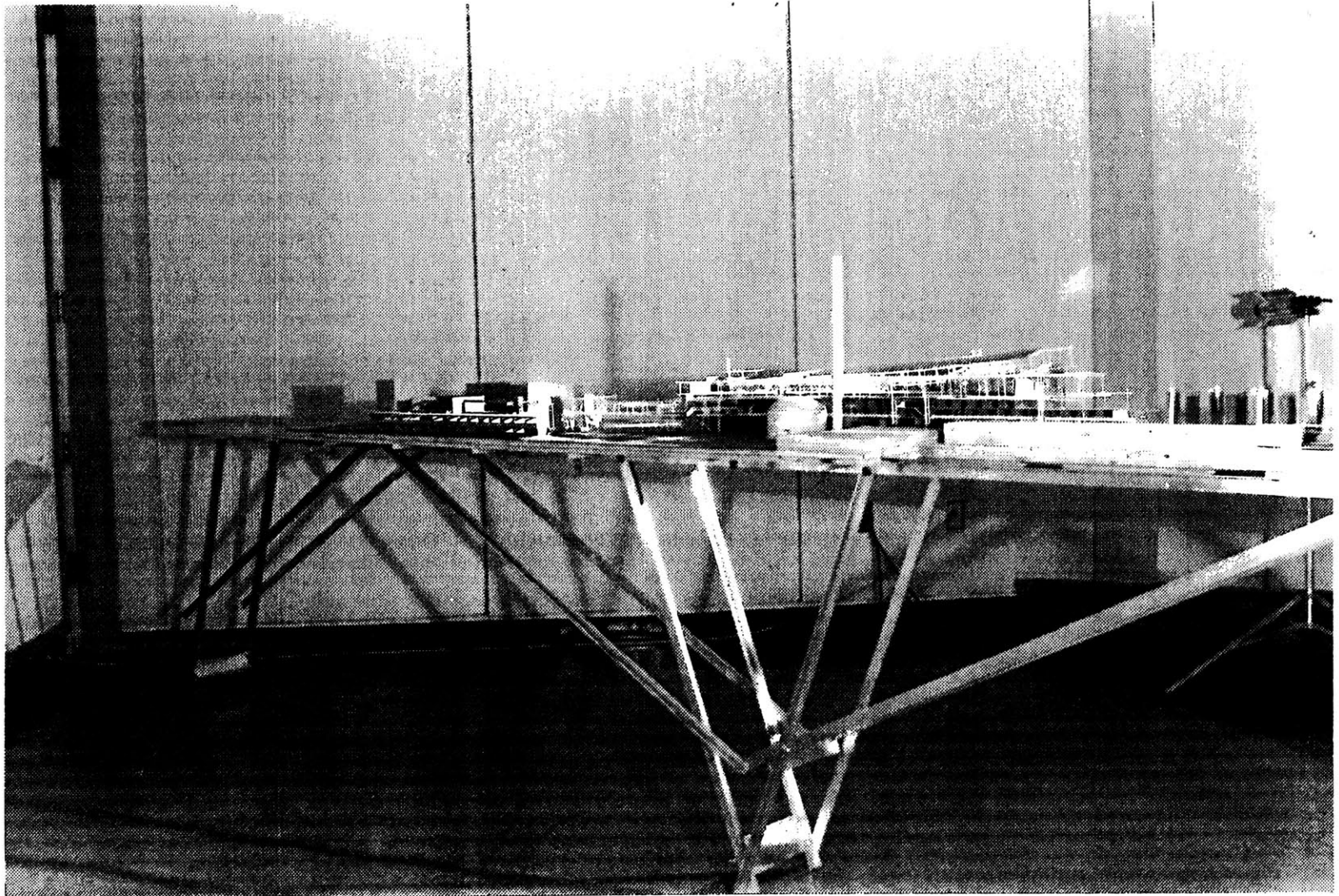


| Laboratory machinery in the project



| Sketch of the MIT Museum crossing Mass. Ave.



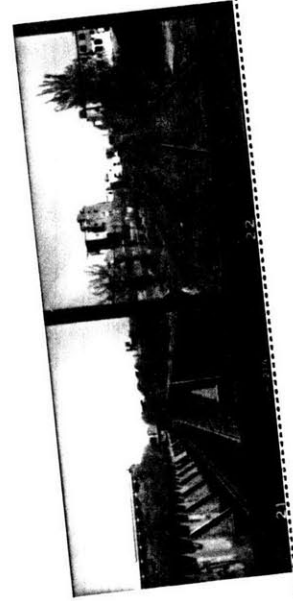


Elevation of Anchor 1

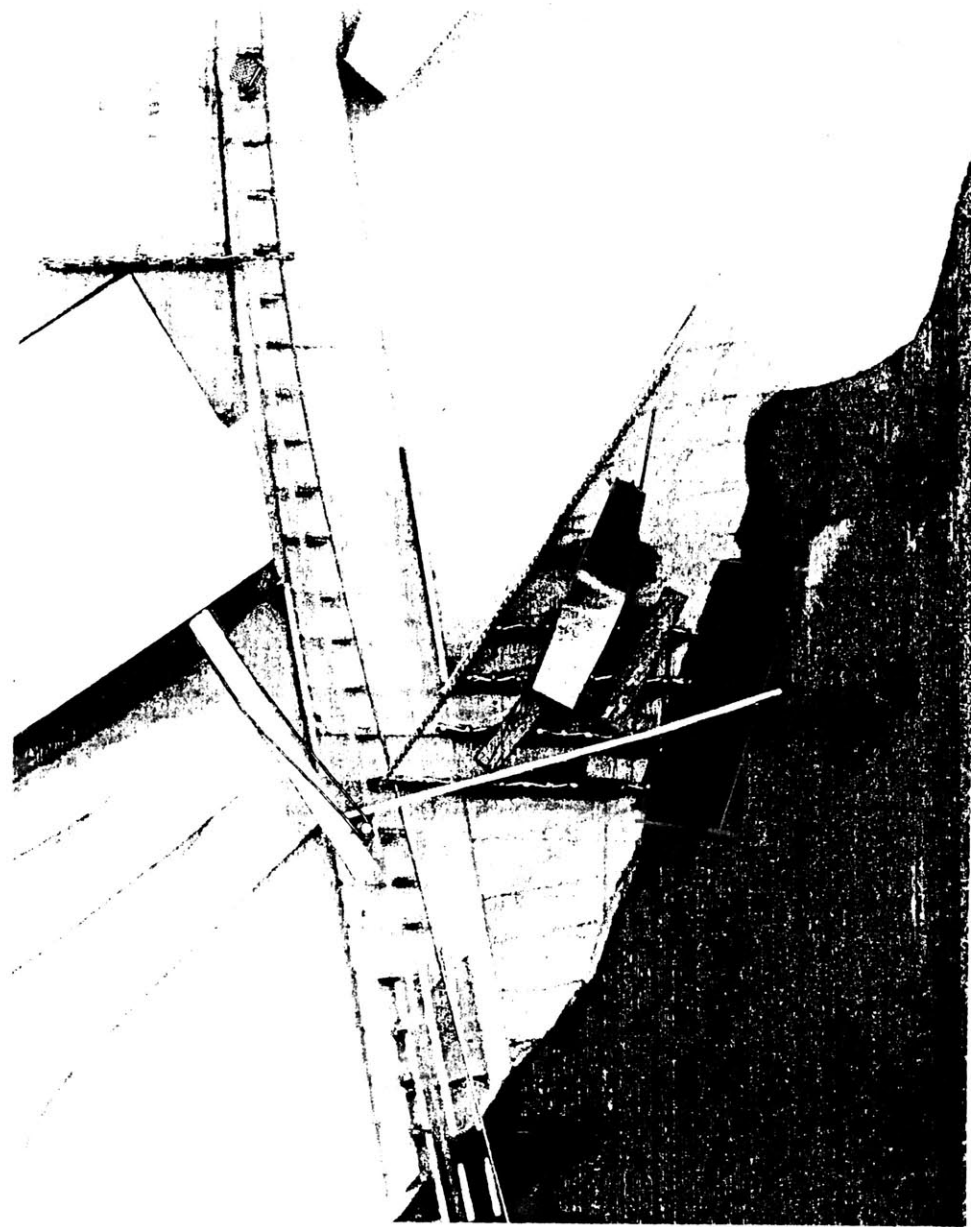


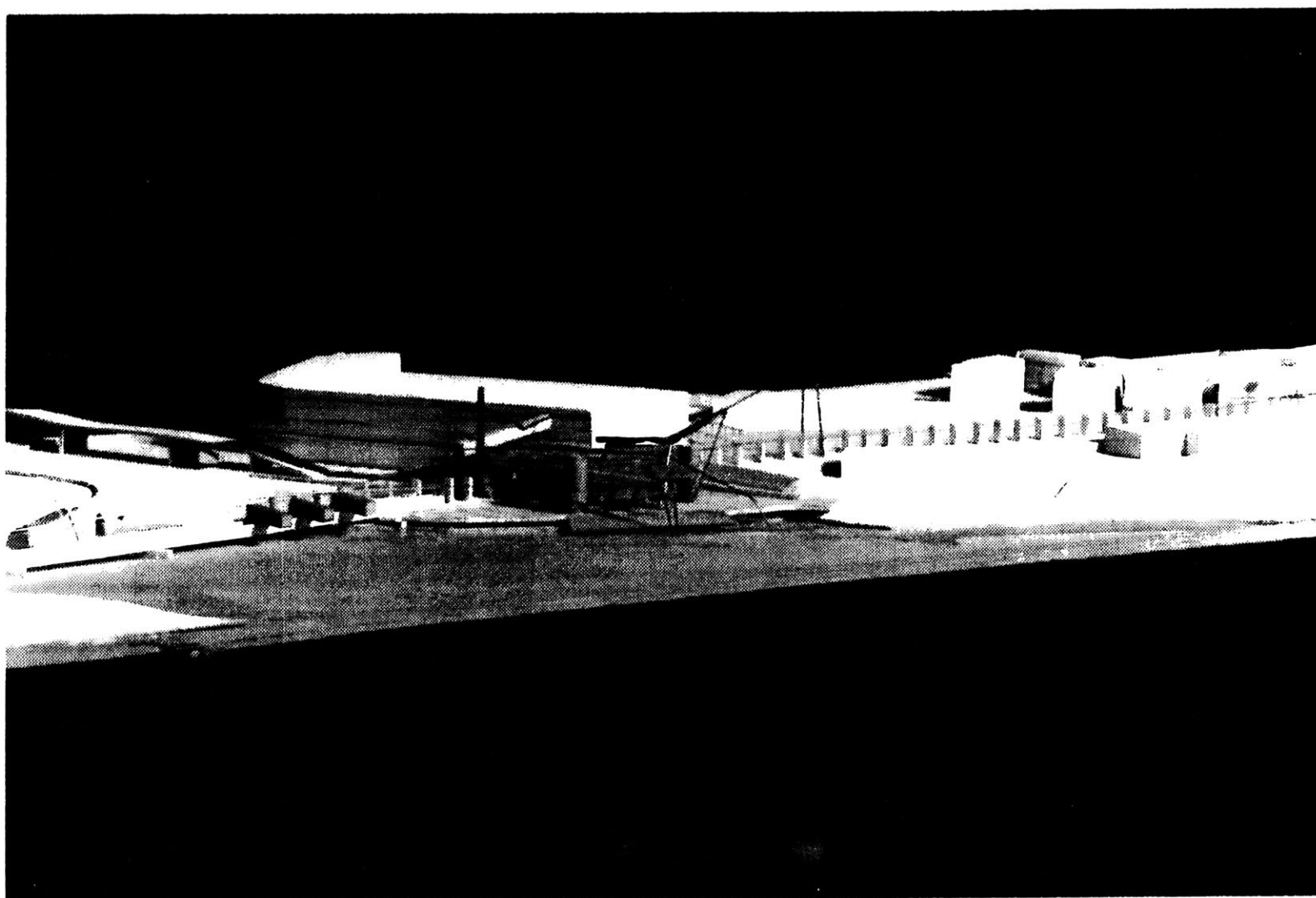
! 4.4 Anchor 2

Anchor 2









| Conceptual model of the river end of the project

### *Anchor 2*

Charles River at the Boston University Bridge crossing is the site of the second formal anchor.

This section of the design responds to the need for an urban landmark. By virtue of its prime location on the river, this part of the project could be visible from as far away as Beacon Hill.

The forms of this anchor gesture to the city, and so orient the user to the extended views of this place. The site is somewhat isolated by Memorial Drive, which passes over the project to the east. This anchor is a sign to the city and a gate .

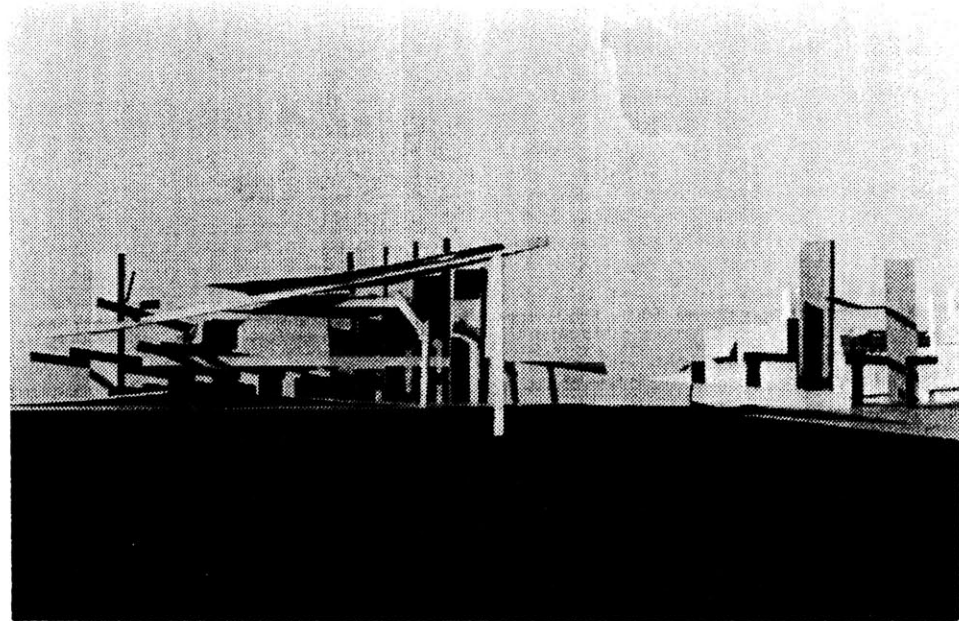
The facilities include

#### **-Boathouse**

A sweep rowing and sculling facility for Boston University (lower level)

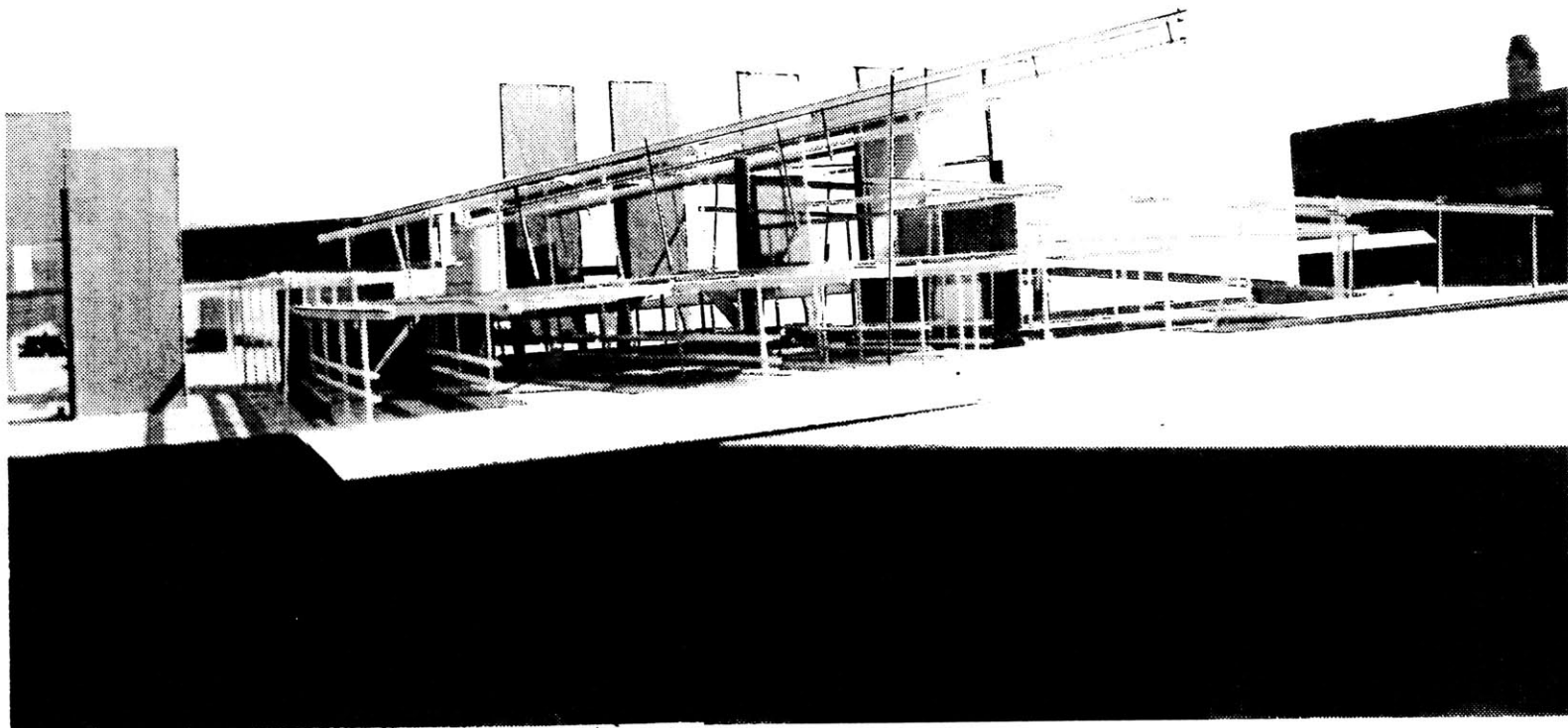
#### **-Metroparks Information Center**

A Place to inform people about the new metroparks extension (upper level) which will be both a park and an informational viewing of technology's history (including some MIT labs).

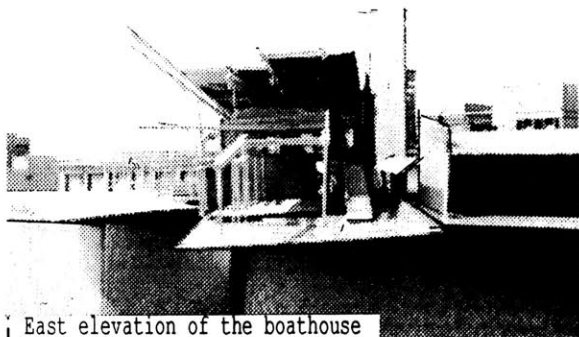


Sketch model of the boathouse/Metroparks information center

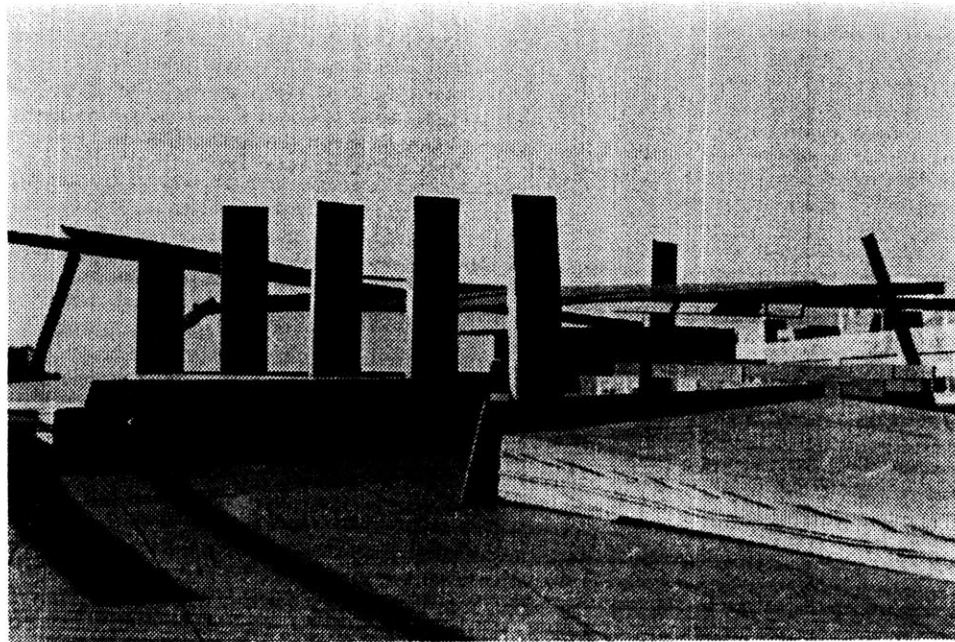




| River elevation of the boathouse/Metroparks information center



East elevation of the boathouse

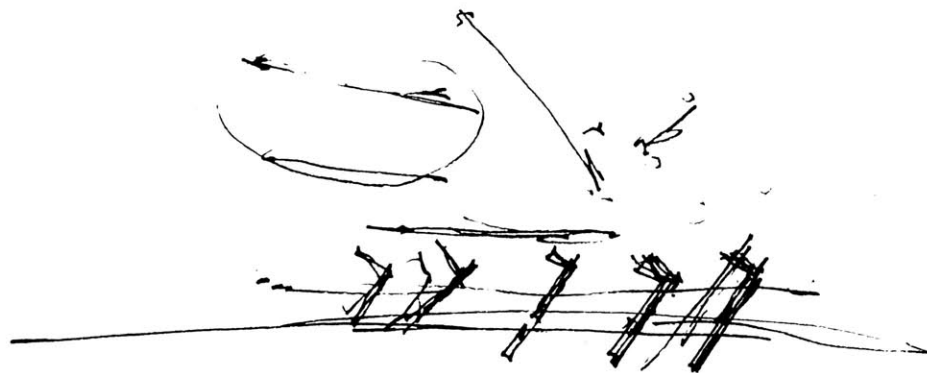


Sketch model of the boathouse, from behind Memorial Drive

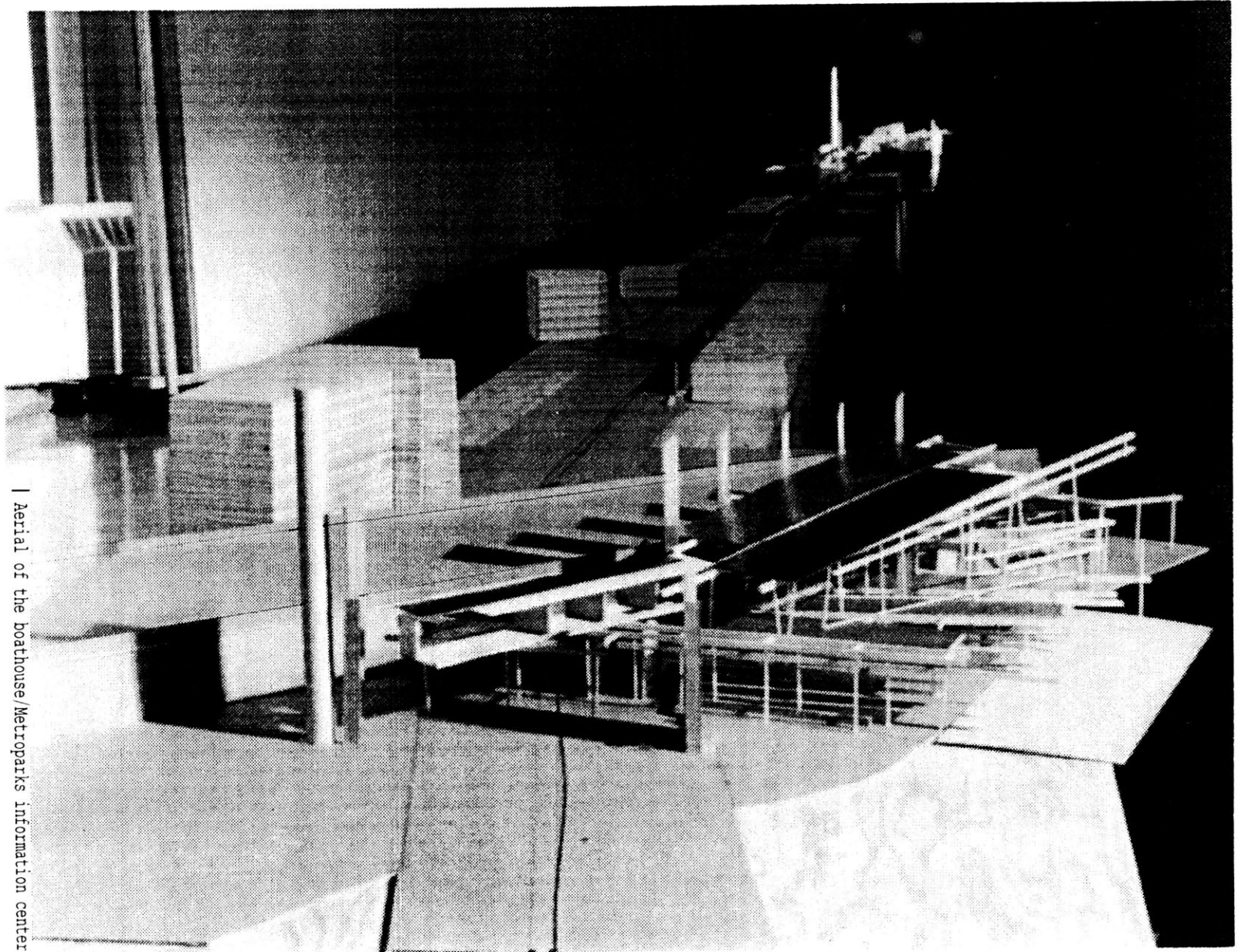


WALLS.

FRUSTRATION.



Sketches of the devices to block the view of oncoming traffic from Memorial Drive

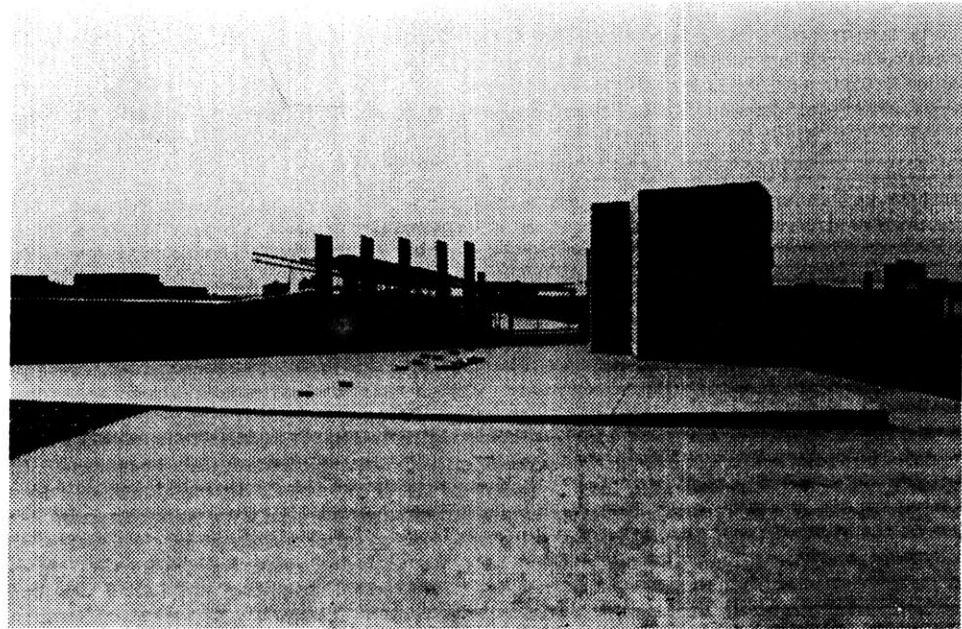


| Aerial of the boathouse/Metroparks information center

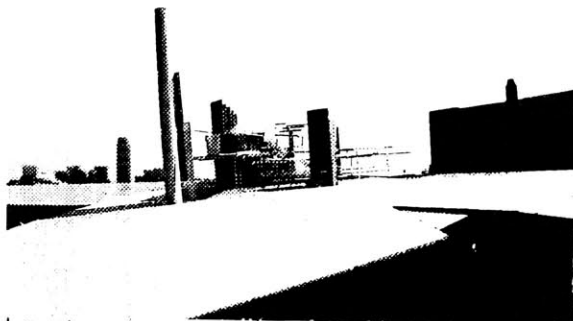




| Site Photo at Memorial Drive



| Boathouse/Metroparks information center from behind Memorial Drive



| Boathouse/Metroparks information center from the west





## 5.0 CONCLUSIONS

### *City*

How does one make an urban intervention that enriches the life of the city?

The notion of the transparent city acts as a means for the design project. This relationship between the revealed city and the city as a living artifact became the focus of this exploration. This reduced the importance of many of the urban issues, which could have played a more dominant role in the formulating of the problem. Therefore, this project's focus of intervening in the city in an intellectual capacity may have overshadowed its ability to become a working part of the city.

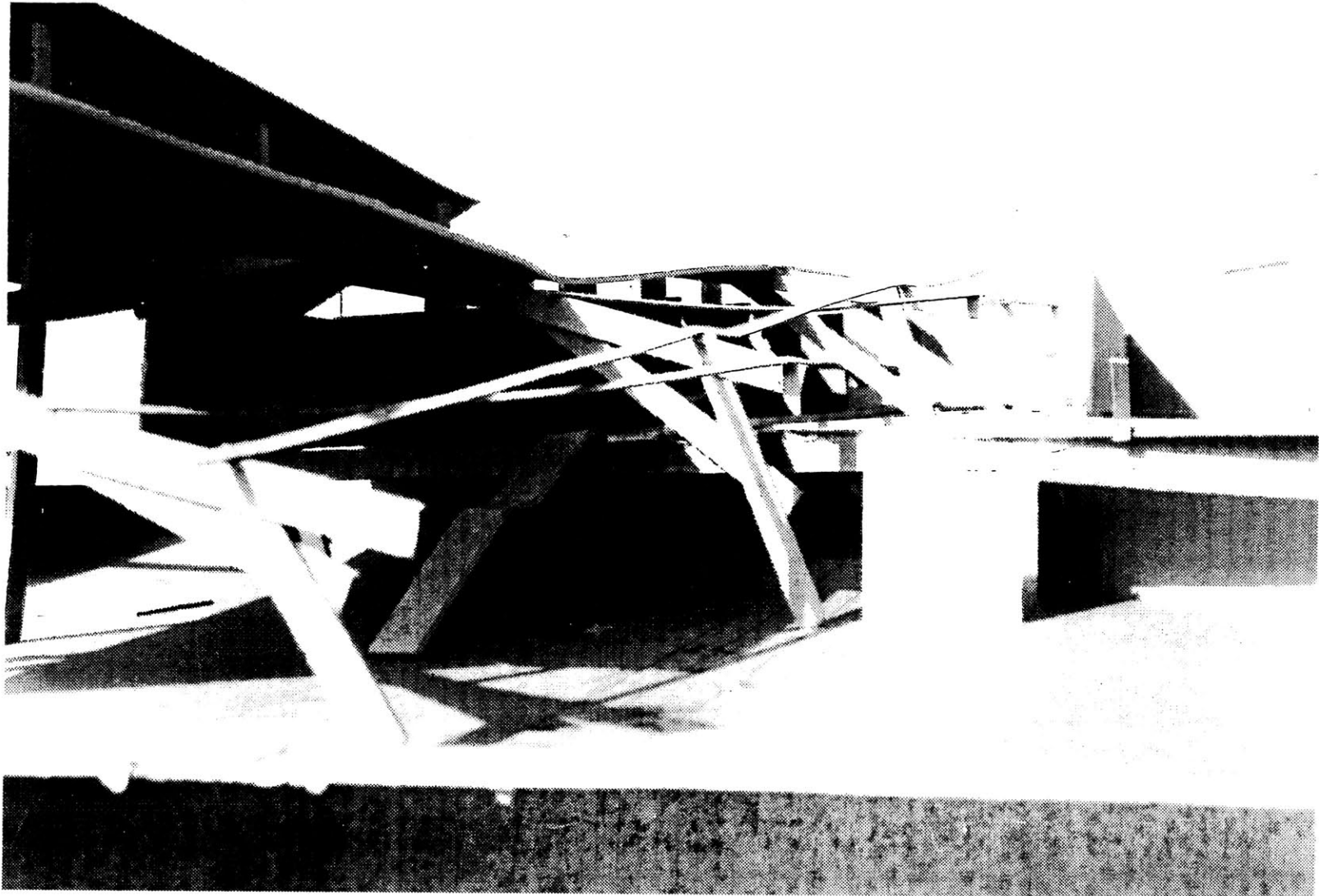
In the design, the framework took on a very physical character which might be too dominant. The preservation of the character of the current site is compromised by the physical presence of the framework needed to provide continuity to the site.

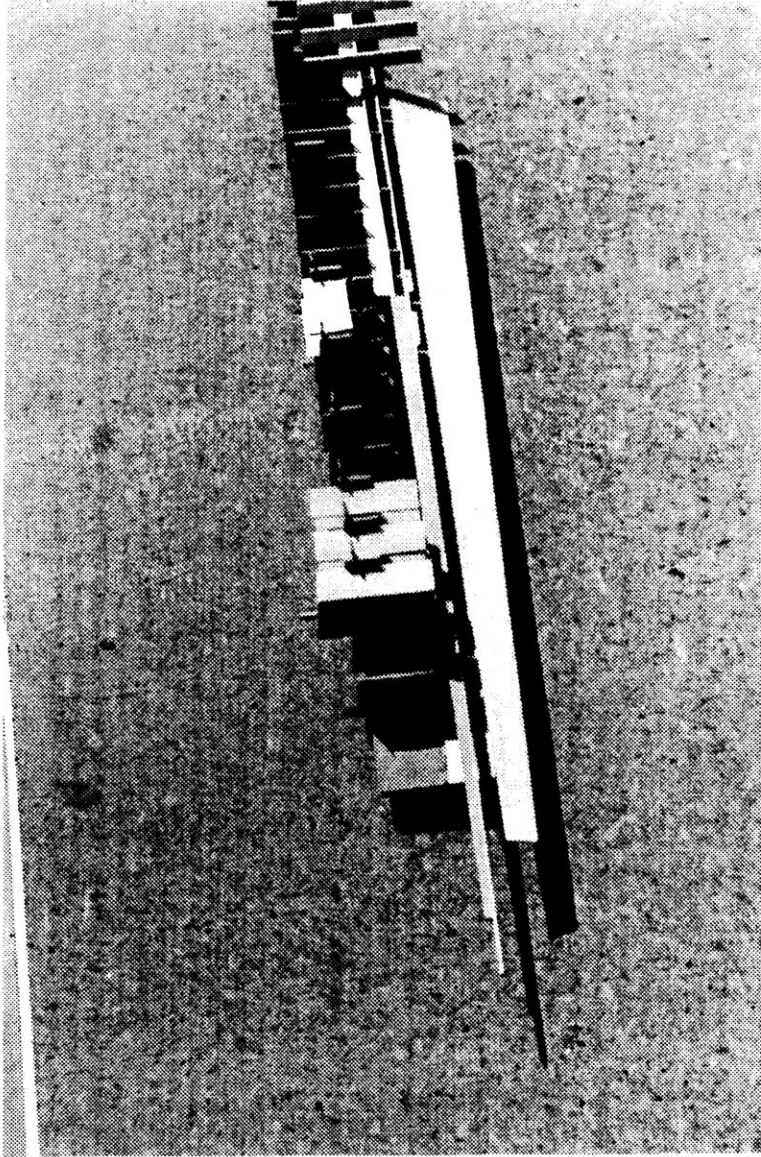
In the making of this urban intervention the question still is how does one order the intervention and allow it to work with the city. A system that can knit together the notions of urban vision and publicness with the physical city is the essence of the framework. The strength of the framework lies in its ability to function with the most minimal presence. It needs to be efficient and not overwhelming.

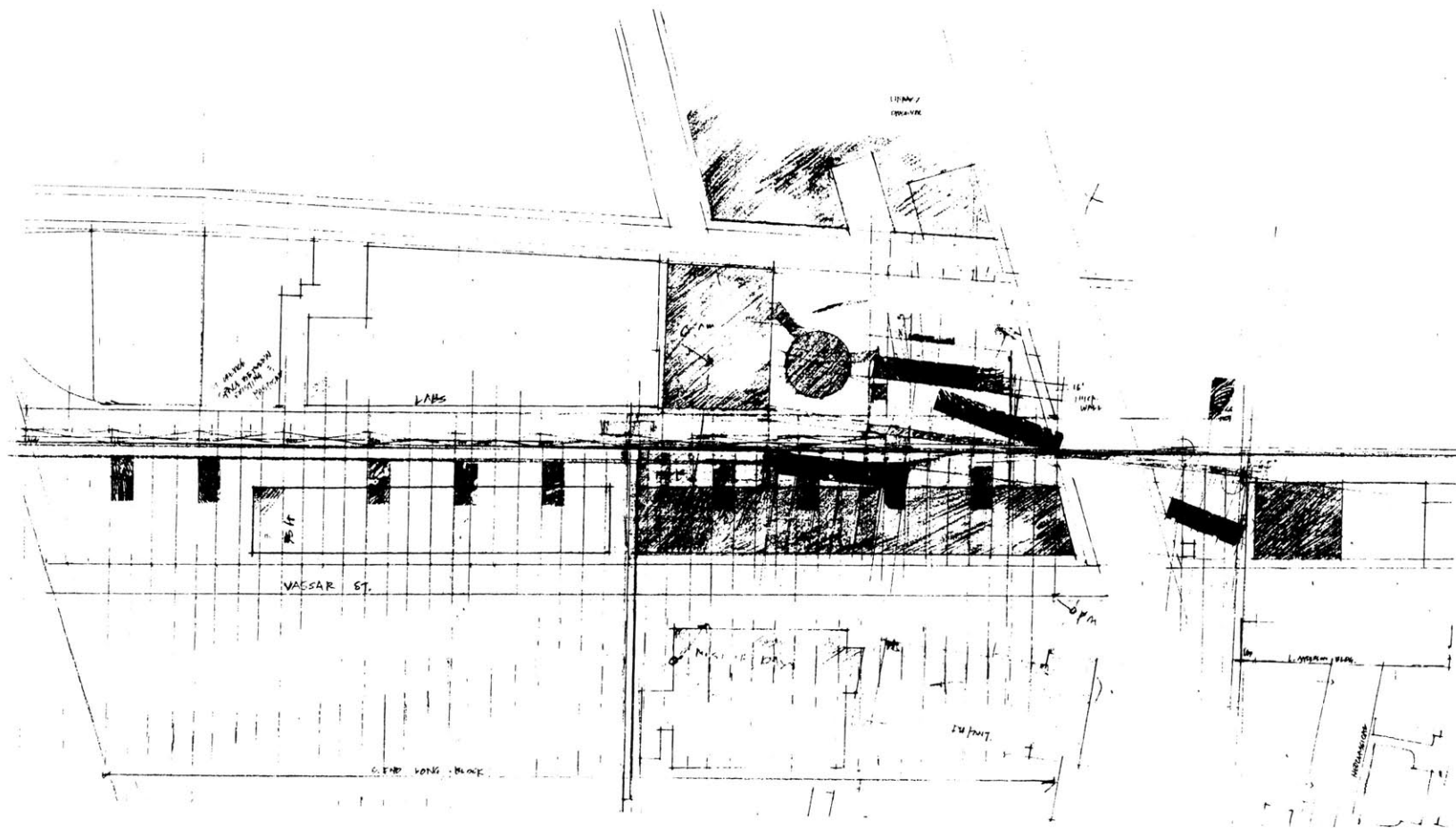


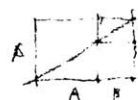
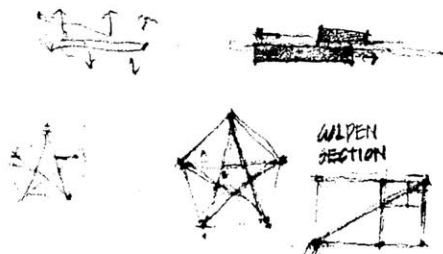
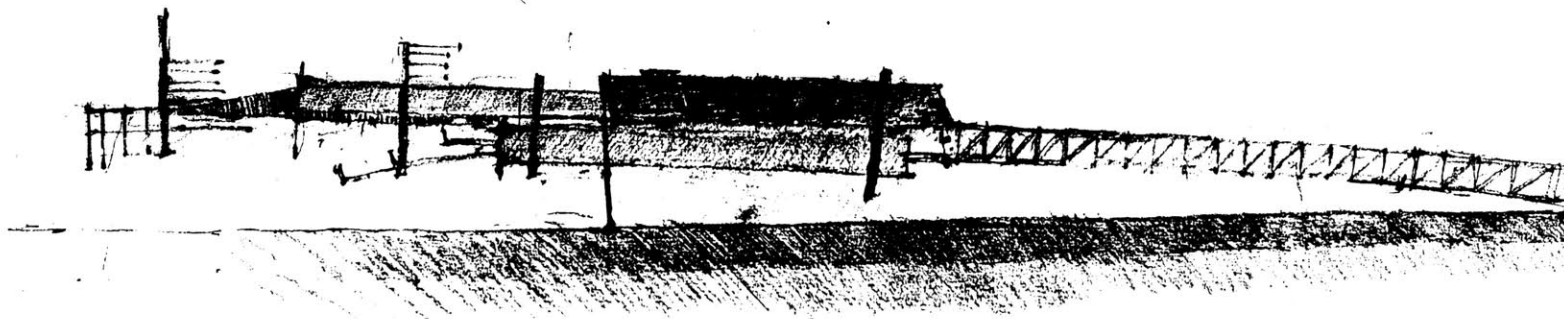


Appendix A: Design notebook







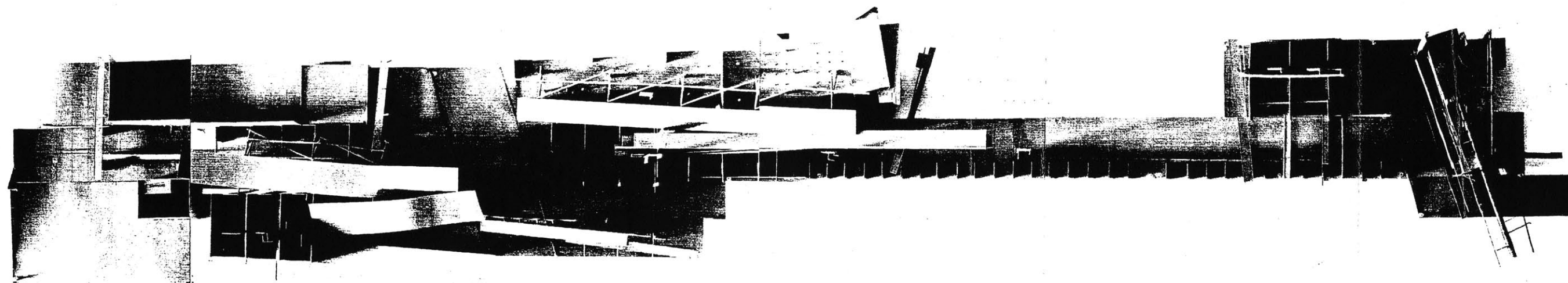


$$B+C=A \quad \frac{A}{B} = \frac{B}{C}$$

$$\frac{B+C}{B} = \frac{B}{C}$$

$$1 + \frac{C}{B} = \frac{B}{C}$$

$$\frac{B+C}{B} = \frac{B}{C} \quad \frac{B+C}{B} = \frac{B}{C}$$







## Appendix B: Bibliography

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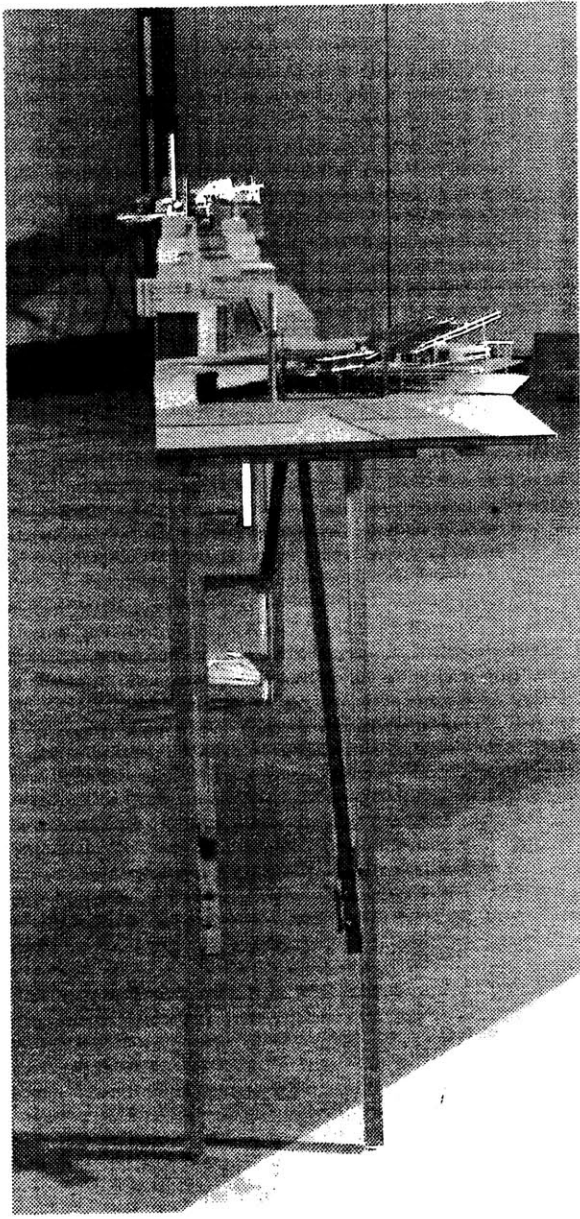
Norberg-Schulz, Christain, Existence, Space, and Architecture. New York: Praeger Publishers, 1972.

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Venturi, Robert, Complexity and Contradiction in Architecture. New York: Museum of Modern Art, 1966.



## Appendix C: Photo Credits

p.3 Howard, Neal D., editor, Railway Engineering and Maintenance Cyclopedia. Chicago, IL: Simmons-Boardman Publishing Corp., 1948.

p.4 Charles Sheeler, *Rolling Power*, 1939.  
from Danly, Susan, and Marx, Leo, editors, The Railroad in American Art. Cambridge,MA: MIT Press, 1988.

p.8 Rand McNally map of Boston

p.13 Edward Hopper, *Approaching a City*, 1946.  
from Danly, Susan, and Marx, Leo, editors, The Railroad in American Art. Cambridge,MA: MIT Press, 1988.

p.15 United Airlines brochure

p.17 Edward Hopper, *Hotel by a Railroad*, 1952  
from Danly, Susan, and Marx, Leo, editors, The Railroad in American Art. Cambridge,MA: MIT Press, 1988.

p.19 William England, *Niagara Suspension Bridge*, 1859  
from Danly, Susan, and Marx, Leo, editors, The Railroad in American Art. Cambridge,MA: MIT Press, 1988.

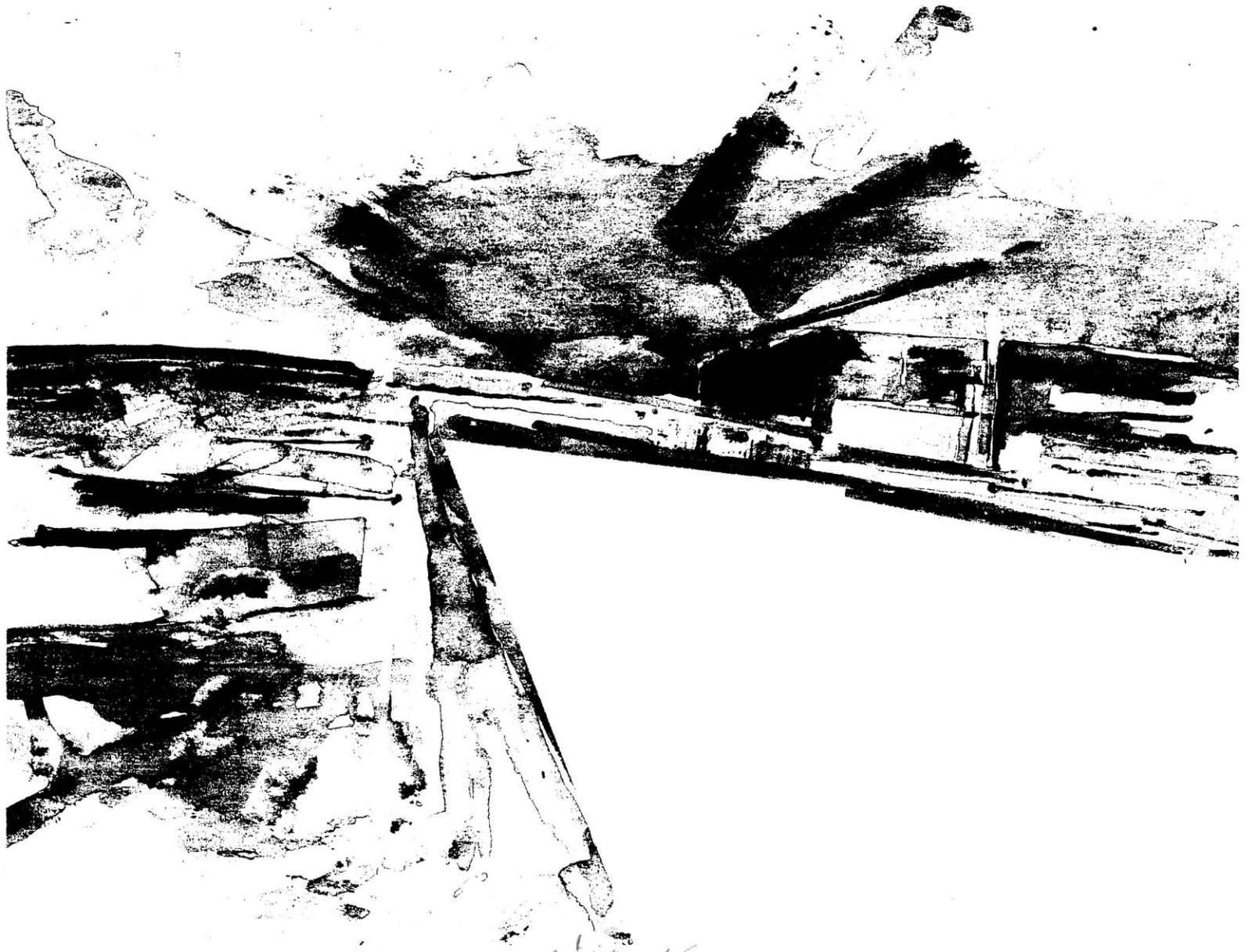
p.21 Corral of Valvanera, Seville, Spain.  
from Rossi, Aldo, The Architecture of the City. Cambridge,MA: MIT Press, 1982.

p.24 Aqueduct, Segovia, Spain.  
from Rossi, Aldo, The Architecture of the City. Cambridge,MA: MIT Press, 1982.

p.28 Calle Pais Vasco, Viana, Spain.  
from Rossi, Aldo, The Architecture of the City. Cambridge,MA: MIT Press, 1982.

p.32 Rand McNally map of Boston

all other illustrations by the author



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